U.S. Department
of Transportation

BUDGET ESTIMATES
FISCAL YEAR 2010

FEDERAL AVIATION ADMINISTRATION

SUBMITTED FOR USE OF
THE COMMITTEES ON APPROPRIATIONS

Federal Aviation Administration
FY 2010 President's Budget Submission

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Section 5. – RESEARCH, DEVELOPMENT and TECHNOLOGY

OVERVIEW

Introduction

The FAA operates and maintains the most complex air traffic control system in the world. Over the past several years, we have made progress in increasing the system's safety and efficiency. We are also investing responsibly in capital programs and in our highly capable workforce in order to prepare for a future marked by ever-growing demand for aviation-related services.

FAA's FY 2010 budget maintains these recent safety and capacity gains while providing the level of investment required to meet future system demands. This budget allows us to execute our published plans for controller and safety staffing, research and development, capital investment, and NextGen, thus further enhancing aviation safety while we implement the aviation system of the future.

Safety continues to be our number one priority. The FY 2010 budget includes funding to hire a net increase of 107 new air traffic controllers, a level consistent with the updated version of the Controller Workforce Plan. In the last three years, FAA has hired more than 5,500 new air traffic controllers, ensuring the flexibility to match the number of controllers with traffic volume and workload. As we continue to bring these new employees on board, we must carefully manage the process to ensure that our trainees progress in a timely manner and are hired in the places we need them. By improving our training techniques and using high-fidelity simulators, we have reduced the training period from an average of 3-5 years down to 2-3 years. Our goal is to limit the controller-to-trainee ratio to less than 35 percent of the workforce, ensuring there are adequate numbers of fully trained controllers in all facilities. There are as many controllers on board today as there were in 2000, and adjusted for traffic levels, there are more Certified Professional Controllers (CPCs) on board today than in 2000.

The FY 2010 request maintains the staff added to our Aviation Safety workforce in FY 2007—2009 while increasing staffing by 36 positions in FY 2010. The staffing increase is consistent with the updated *Aviation Safety Workforce Plan* and enables FAA to review additional applications for aeronautical products and parts and increase drug inspections. In addition, the FY 2010 budget request supports additional positions that will perform analysis of emerging risk, future hazards, and trends within the National Airspace System (NAS).

We need to continue moving forward with the Next Generation Air Transportation System (NextGen) so that the system is able to handle the demand when traffic levels return. Despite recent, temporary drops in air traffic levels, NextGen is needed to improve efficiency, create additional capacity, and provide enhancements to safety and environmental performance. NextGen will mean new technologies, procedures, standards, and roles and responsibilities for pilots and controllers. Given the scope of this undertaking, substantial investment is required now to achieve near-term deployment of mature technologies, develop moderately mature concepts for operational viability, and perform research to better define long-term capabilities. As it is implemented, NextGen will gradually allow aircraft to safely fly more closely together on more direct routes, reducing delays, and providing benefits for the environment and the economy through reductions in carbon emissions, fuel consumption, and noise. The FY 2010 budget provides a total of $865 million in support of NextGen, an increase of 24 percent over FY 2009.

Overview by Appropriation Account

Operations

The FY 2010 request of $9,336 million is an increase of $293 million (3.2 percent) above the FY 2009 enacted level. This level will fund salary increases for FAA employees, annualization of FY 2009 new hires, adjustments for inflation and GSA rent increases, maintenance and operating costs of new NAS systems and equipment, and mandatory wage increases for flight services and contract towers. Major policy initiatives funded by the request include the hiring of additional air traffic controllers, aviation safety staff, and NextGen support staff. The request also incorporates $48 million of new cost efficiencies realized by the Air

Traffic Organization (ATO) as well as several base transfers among FAA organizations that better align our resources with organizational functions.

The FAA's ten-year strategy for the air traffic control workforce calls for a net increase of 107 controllers in FY 2010. The budget supports this effort so that FAA can continue to ensure that the right number of trained controllers are in the right place at the right time. In March 2008, FAA published its first *Aviation Safety Workforce Plan* outlining how the Aviation Safety organization will maintain a highly trained and proficient workforce as it transitions to a Safety Management System (SMS). The FY 2010 budget supports the updated plan, providing $13.2 million to annualize the cost of new safety staff added in FY 2009 and $3.1 million for 36 additional staff in FY 2010.

Recognizing that our future workforce may be very different from today, last year FAA engaged the National Academy of Public Administration (NAPA) to help identify the skills needed to accomplish the transition to NextGen and strategies for acquiring the necessary workforce competencies. To respond to some of NAPA's recommendations, the FY 2010 budget includes $7 million to hire 104 technical staff in the ATO operational service units to support the development and deployment of the NextGen suite of applications. These additional staff will identify transition requirements, develop procedures, coordinate with industry and stakeholders, and perform operational impact analyses.

The NAS continues to grow in size and complexity, with an average of 2,162 new pieces of equipment procured and fielded each year. Operations base funding is increased to include recurring operating costs of systems and equipment that were fielded in previous years. The budget request provides $42 million for newly commissioned systems that must be maintained in a highly reliable condition to achieve their projected safety and capacity benefits. Some of the systems and equipment transferring to Operations in FY 2010 include Common Automation Radar Terminal System (CARTS), air traffic control training simulators, Airport Surface Detection Equipment – Model X (ASDE-X), Integrated Display System (IDS) Model 4, and Airspace Management Laboratory.

The FY 2010 Operations request also reflects $48 million in new cost savings realized by the Air Traffic Organization. These savings will be accomplished in the areas of leases and utilities, Service Center business process reengineering, and administrative efficiencies. The ATO is continuing its recent efforts to reduce facility space, rent, and utilities costs through Service Center consolidation; streamline administrative operations; consolidate the overhead function in headquarters; and pursue savings in the procurement of supplies and equipment.

Facilities & Equipment (F&E)

The FY 2010 budget allows FAA to meet the challenge of both maintaining the capacity and safety of the current NAS while attempting to keep our comprehensive modernization and transformation efforts on track. The request of $2,925 million is an increase of $183 million (6.7 percent) above the FY 2009 enacted level. The majority of our investment – $2,135 million – will be in legacy areas, including aging infrastructure, power systems, information technology, navigational aids, and weather systems. The F&E NextGen portfolio grows to $790 million. This 24 percent increase over FY 2009 includes growth in FY 2009 programs as well as the inclusion of other line items under the NextGen umbrella[1]. A more detailed discussion of the NextGen effort is included later in this section.

Research, Engineering & Development (RE&D)

The FY 2010 request of $180 million is an increase of $9 million (5.3 percent) above the FY 2009 enacted level. This funding will allow us to continue our work in legacy research areas, including fire research and safety, propulsion and fuel systems, advanced materials research, and aging aircraft. The RE&D NextGen portfolio grows to $65 million. This 15 percent increase over FY 2009 supports enhanced NextGen research and development efforts in the areas of air ground integration, weather in the cockpit, and environmental research for aircraft technologies, fuels, and metrics. A more detailed discussion of the NextGen effort is included later in this section.

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[1] Beginning in FY 2010, funding for Collaborative Air Traffic Management Technologies and Activity 5 are included under the NextGen portfolio. If these two activities were included in the FY 2009 portfolio, the FY 2010 NextGen increase would be 17 percent.

Grants-in-Aid for Airports

Airports are an essential part of the aviation system infrastructure. Their design, structural integrity, and ongoing maintenance have a direct impact on safety, capacity, and efficiency. The FY 2010 request of $3,515 million allows us to continue our focus on safety-related development projects, including runway safety area improvements, runway incursion reduction, aviation safety management, and improving infrastructure conditions.

The request provides programmatic increases of $1.9 million in Personnel & Related Expenses to fully implement Safety Management Systems (SMS) in the Office of Airports, initiate a program to collect data on over 14,000 private airports, and hire additional positions supporting international aviation, information technology, engineering support, airspace studies, and wildlife hazard management. The budget also provides $22.5 million for Airport Technology Research – an increase of $3.1 million over FY 2009 – to support enhanced safety and pavement research efforts, and $15 million for Airport Cooperative Research.

NextGen

The aviation sector will be an important factor in the nation's economic recovery, and building a new air traffic control system will be the springboard to make it happen. NextGen represents a wide-ranging transformation of the entire national air transportation system to meet future demand and support the economic viability of aviation while improving safety and protecting the environment. NextGen will change the way the air transportation system operates – reducing congestion, noise, and emissions, expanding capacity and improving the passenger experience. NextGen is a highly complex, multilayered, long-term evolutionary process of developing and implementing new technologies and procedures.

As FAA lays the groundwork for this dramatic transformation, new technology and procedures are already being implemented to provide immediate benefits to operators. Planned investments are aimed at delivering programs that will truly transform the NAS and deliver the definitive NextGen vision giving us new ways to fly. Although the current system is the safest in the world, NextGen is needed to bring to air transportation the same twenty-first century processes that give operations in other industries reliability, flexibility, and predictability.

Step by step and procedure by procedure, reliance on ground-based technology is being reduced. The satellite era is well under way, and the aviation world is putting itself in the place where it can be used to greatest benefit. With that said, the installation of certified avionics in the cockpit will be essential to the realization of NextGen capabilities. NextGen will require significant investment by aircraft operators. By providing approximately $170 million above fiscal year 2009 enacted levels, the budget positions FAA to meet the future demand that will occur as the nation's economy improves. It also supports NextGen's provision of environmental benefits to reduce aircraft noise and emissions.

In 2008, the National Academy of Public Administration (NAPA) published a report titled "Identifying the Workforce to Respond to a National Imperative…the Next Generation Air Transportation System (NextGen)." The study behind the report was commissioned by FAA with the objective of identifying skill sets needed by the non-operational (acquisition) workforce to design, develop, test, evaluate, integrate, and implement NextGen systems and procedures and the strategies to obtain the needed skills. The budget allows FAA to further acquire and develop the competencies identified in the NAPA report.

The budget also supports the broad initiatives outlined in FAA's NextGen Implementation Plan, which was published in January 2009, and the NAS Enterprise Architecture. These documents provide a picture of NextGen near-term deliverables (through 2012) as well as targets for the mid-term (2013-2018), which the budget supports through increased funding for NextGen Solution Set activities. The budget allows NextGen to continue on schedule, enabling FAA to successfully develop NextGen capabilities and acquire NextGen transformational programs.

FAA is moving forward with a dual-pronged approach for implementing NextGen: maximizing the use of untapped capabilities in today's aircraft and ground infrastructure, while working aggressively to develop and deploy new systems and procedures that will form a foundation for more transformative capabilities that will be delivered in the mid-term. This approach allows both government and industry to extract the greatest value from existing investments, while positioning the industry to gain exponential benefits in the mid-term and beyond.

NextGen is expected to yield significant benefits in terms of delay reduction, fuel savings, additional capacity, improved access, enhanced safety, and reduced environmental impact. Last year we estimated that NextGen would reduce delay by 35-40 percent in 2018 compared to what the system would experience without NextGen. We are currently preparing an updated, detailed breakdown of the near- to mid-term NextGen benefits. This analysis will be completed in the near future, and updated annually in conjunction with FAA's budget submission.

Some of the planned NextGen programmatic deliverables for FY 2010 are listed below.

Automatic Dependent Surveillance – Broadcast (ADS-B)	• Initial Operating Capability (IOC) of Surveillance Services for Louisville, Gulf of Mexico, Philadelphia & Juneau • Publish Final Rule • Critical Surveillance Services In-Service Decision for ADS-B • Complete installation of 340 (of 794 total) ground stations (Installation completed at all remaining ground stations by 2013)
Data Communications	• Screening Information Request (SIR) release for Data Communications Network Service provider acquisition
NextGen Network Enabled Weather (NNEW)	• Demonstration of limited 4-D Weather Data Cube functionality including fault tolerance and federation of the registry/repository
NAS Voice Switch (NVS)	• Initial Investment Decision
System Wide Information Management (SWIM)	• Final requirements specification and Investment Analysis for Segment 2 • Final Investment Analysis for Segment 2 capabilities

The table on the following page outlines the NextGen programs and activities that are supported by the FY 2010 budget. The FY 2010 NextGen portfolio of $865 million consists of $790 million in F&E programs, $65 million in Research, Engineering & Development and $9.4 million in Operations.

NextGen Programs
($ in Thousands)

	FY 2009 Enacted	FY 2010 Request
Facilities & Equipment		
NextGen Network Enabled Weather (NNEW)	20,000	20,000
Data Communications for Trajectory Based Operations	28,800	51,700
Demonstrations and Infrastructure Development	28,000	33,774
NextGen – System Development	41,400	66,100
NextGen – Trajectory Based Operations	39,500	63,500
NextGen – Reduced Weather Impact	14,400	35,600
NextGen – High Density Arrivals/Departures	18,200	51,800
NextGen – Collaborative ATM	27,700	44,641
NextGen – Flexible Terminals and Airports	37,100	64,300
NextGen – Safety, Security and Environment	8,000	8,200
NextGen – Networked Facilities	15,000	24,000
System-Wide Information Management	43,043	54,600
ADS-B NAS Wide Implementation – Segment 1b	300,000	201,350
ADS-B Three Nautical Mile Separation	6,765	-
NAS Voice Switch	10,000	26,600
Collaborative ATM Technologies[1]	-	18,100
Activity 5 F&E PCBT - NextGen[2]	-	26,250
Subtotal, Facilities & Equipment	**637,908**	**790,515**
Research, Engineering and Development (RE&D)		
Wake Turbulence	7,370	7,605
NextGen – Air Ground Integration	2,554	5,688
NextGen – Self Separation	8,025	8,247
NextGen – Weather in the Cockpit	8,049	9,570
NextGen Environmental Research – Aircraft Technologies, Fuels and Metrics	16,050	19,470
NextGen – JPDO	14,466	14,407
Subtotal, R,E&D	**56,514**	**64,987**
Operations		
NextGen Environmental/Noise Studies	-	1,665
NextGen Staffing	-	7,000
NextGen – Environmental Performance	704	725
Subtotal, Operations	**704**	**9,390**
Total NextGen Programs	**695,126**	**864,892**

[1] Beginning in FY 2010, funding for Collaborative ATM Technologies is included in the NextGen portfolio. The FY 2009 NextGen amount for this activity is $13 million.

[2] Beginning in FY 2010, Activity 5 funding is included in the NextGen portfolio. The FY 2009 NextGen amount for this activity is $25.5 million.

FAA Funding Reform and Reauthorization

Starting in 2011, the budget assumes a scenario where most of the air traffic control system would be paid for by direct charges levied on users of the system. The FAA's current excise tax system, which generated $12.4 billion in 2008, is largely based on taxes that depend upon the price of customers' airline tickets, not FAA's cost for moving flights through the system. The Administration believes that the FAA should move towards a model where FAA funding is related to its costs, the financing burden is distributed more equitably, and funds are used to directly pay for services the users need. The Administration recognizes that there are multiple ways to achieve these objectives. Accordingly, the Administration will work with stakeholders and Congress to enact legislation that moves toward such a system. The potential scenario displayed in the Budget estimates FAA would collect $9.6 billion for air traffic services in the first year and credits those collections as discretionary user charges.

Implementing DOT's Strategic Goals

Safety

The budget request supports *Increased Safety*, DOT and FAA's most important strategic objective. The FAA estimates approximately 44 percent of the agency's FY 2010 budget will be required to maintain and improve the agency's safety programs. Our efforts to improve operations have contributed to the safest period in aviation history. Even so, our goal is to continue to improve safety. One major key to our successful safety efforts is cooperation among our stakeholders. We constantly work with stakeholders to meet our safety goal. Each group helps contribute to a safer airspace system through technology, communications, and its own unique expertise. In our responsibility for safety oversight, we work with them to establish their own safety management systems to identify potential areas of risk. Then we work together to address these risk areas.

The FAA places a high priority on initiatives to reduce runway incursions, and will continue to implement recommendations that reduce their occurrence. These initiatives include enhanced runway and taxiway markings, improved lighting such as runway status lights, and improving driver training. The Runway Incursion Reduction Program will remain a catalyst to initiate acquisition activities to facilitate transition of promising safety technologies that have reached a level of maturity deemed appropriate for NAS transition and implementation. The FAA will continue its efforts to implement the ASDE-X system at 16 airports. The ASDE-X system provides air traffic controllers with a visual representation of the traffic situation on the airport surface movement area and arrival corridors. This increased awareness on the airport surface movement area is essential to reduce runway collision risks and critical Category A & B runway incursions.

The FY 2010 budget will allow FAA to further promote safety in the rapidly developing commercial space industry. With the first of many suborbital space tourism flights expected in 2010, FAA's challenge is to maintain its spotless record. The agency also must ensure the availability of resources to handle the increase in licensing activity, permitting activity, and the number of inspections.

Reduced Congestion

NextGen will continue to address today's constraints and comprehensively modernize and transform the air transportation system. The FAA is committed to further improve safety, increase capacity, and reduce congestion and aviation's environmental impact in order to better accommodate traffic growth and to support the economic viability of those who use the system, now and in the future.

The NextGen portfolio of investments focuses on the development and implementation of key NextGen transformational technologies. These include: Automatic Dependent Surveillance-Broadcast (ADS-B), System Wide Information Management (SWIM); Data Communications, NextGen Network-Enabled Weather (NNEW); and NAS Voice Switch (NVS). The capabilities these technologies provide begin a shift of decision-making from the ground to the cockpit. In the future, flight crews will have increased control over their flight trajectories and ground controllers will become traffic flow managers.

Aviation system delays occur when the demand for air transport services exceed the capacity of the system. The ability of the system to respond to demand is a function of airport runway capacity, airspace capacity, the status of air traffic control equipment, and weather conditions. The FAA's Traffic Flow Management system is the key product for coordinating air traffic across the aviation community. The Corridor Integrated Weather System improves air traffic control productivity by increasing the time required to develop and execute effective convective weather mitigation. New runways and runway extensions provide significant capacity increases. In FY 2010, FAA will deliver OEP full operational capabilities for Charlotte-Douglas International Runway 17/35.

Terminal airspace redesign also is essential in the delivery of increased capacity associated with the implementation of new runways. Terminal airspace optimization (mid-term) and redesign (long-term) projects are on-going across the United States. Efforts are planed for all major metropolitan areas and congested terminal areas servicing key airports, focusing on the airspace associated with the 35 OEP airports. When completed these projects will reduce complexity, balance controller workload and reduce en-route flow constraints.

Global Connectivity

The FY 2010 budget request supports expanded global presence, training, and technical assistance to foreign aviation authorities and maintenance of aircraft certification work. Specifically, FAA's leadership presence will be increased by implementing the action plan developed for an Aviation Cooperation Program in Latin America, using the FAA's successful China and India models.

Through strategic activities in FY 2010, FAA will support safety programs in Afghanistan, Africa, and Iraq and build mutually beneficial partnerships with civil aviation organizations in the Middle East, China, India and Latin America. The FAA continues to support government-industry partnerships and strengthening the capabilities of regional aviation authorities and organizations through technical assistance and training.

The FAA provides direct or indirect assistance to over 100 countries around the world to help them improve their aviation systems. The United States is the largest contributor of technical and financial support to the International Civil Aviation Organization (ICAO), which represents 190 of the world's civil aviation authorities. While the worldwide air accident rate has improved over the last ten years, the rate is higher in parts of the world where major growth is forecast to occur over the next century. In this environment, FAA will work with our international partners to be able to ensure that the flying public is able to travel as safely and efficiently abroad as at home.

Environmental Stewardship

The FY 2010 budget request supports FAA's contribution to DOT's Environmental Stewardship strategic goal, DOT facilities clean-up, streamlined environmental reviews and improving aviation fuel efficiency.

The FAA is committed to managing aviation's growth while ensuring the health and welfare impacts of aviation community noise and air quality emissions are reduced. Through efforts such as Continuous Low energy, Emissions and Noise (CLEEN) component level testing, FAA will develop and mature clean and quiet technologies and advance alternative fuels.

The FY 2010 budget request supports identifying and exploring advances in communication, navigation and surveillance technology to advance aircraft arrival and departure, surface movements, and en route/oceanic procedures for reduced noise, fuel burn, and engine emissions.

Security, Preparedness and Response

The FAA continues to ensure and promote aviation safety in support of national security and the national aerospace system. The FY 2010 budget request provides resources for critical infrastructure protection, emergency operations, contingency planning, and the safe transportation of hazardous materials in air commerce.

In particular, budget supports enforcing hazardous materials regulations issued by the DOT Pipeline and Hazardous Materials Safety Administration (PHMSA) and implementing a strategic plan with PHMSA to strengthen those regulations.

Organizational Excellence

The FY 2010 budget request ensures the success of FAA's mission through stronger leadership, a better-trained workforce, enhanced cost control measures, and improved decision-making based on reliable data.

The FAA is taking steps to place the right number of controllers in the right place at the right time to maximize the safety and efficiency of the NAS. In the next decade, FAA must hire almost 15,000 air traffic controllers. The FY 2010 budget request supports the FAA's hiring, training, staffing analysis, and management recommendations of the Air Traffic Controller Workforce Plan.

The FAA strives to invest in high-performing programs and services that increase efficiencies. FAA is implementing the Real Property Asset Management Plan to ensure timely disposition of assets is measured by the number of days to process inactive assets.

The Organizational Excellence funding directly supports DOT's Major Acquisition measures, as well as DOT's performance measures for Major Federally Funded Infrastructure projects. The Government Accountability Office (GAO) removed FAA's air traffic control modernization program from his High Risk List because of the agency's progress over the last several years in keeping programs within budget, on schedule, and for meeting its performance measures and program commitments. The FY 2010 budget request supports continued efforts to remain off GAO's High Risk List.

A Responsible Request

The FAA is doing more than ever to manage itself responsibly, and it is paying off. At the same time, airlines continue to face financial uncertainty and evolve their business models. Without question, we must prepare for the future, and the future begins with responsible investments in capital and a highly capable workforce. Given the vital role aviation plays in the Nation's economy and the need to prepare for the future, our funding request is designed to support America's growing demand for aviation-related services.

Moving America safely. It's what we do.

Lynne A. Osmus
Acting Administrator

FY 2010 FAA Budget Request by Goal
($000)

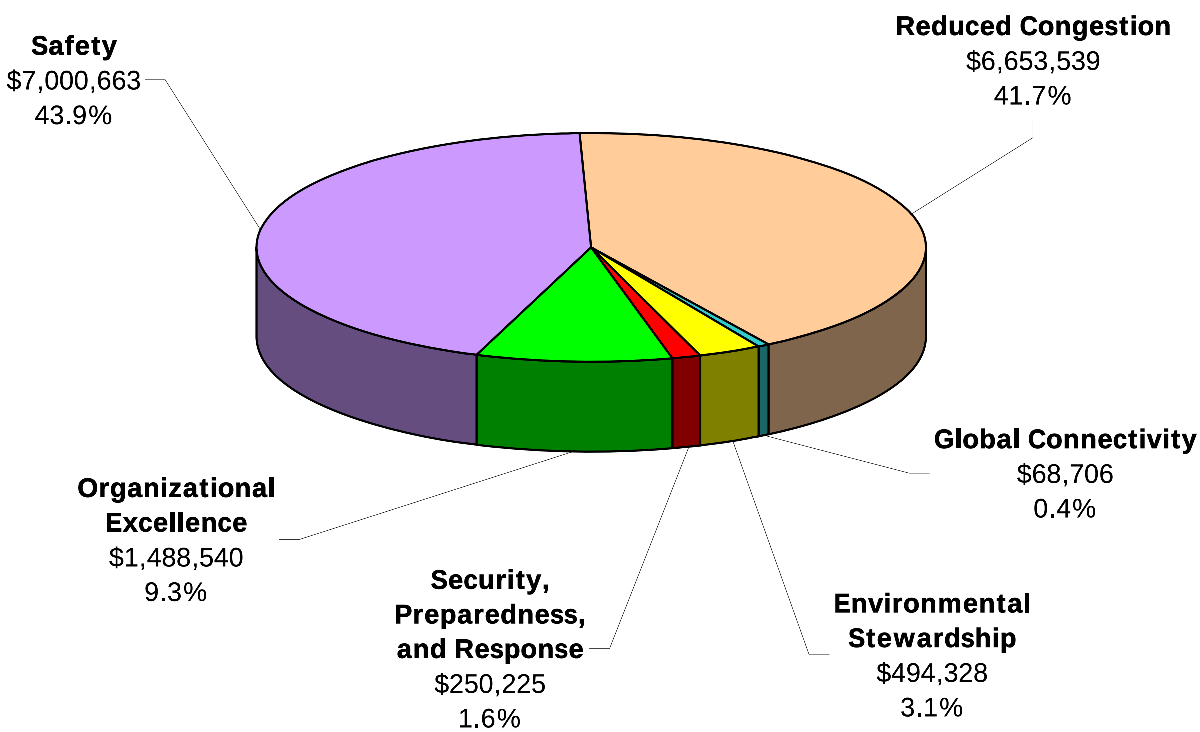

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Exhibit I

FEDERAL AVIATION ADMINISTRATION

Office of the Administrator and Deputy Administrator

Corporate Services
FY 2009 28 FTE/ 30 FTP
FY 2010 24 FTE/ 30 FTP

Assistant Administrator for Civil Rights

Corporate Services
FY 2009 78 FTE/ 83 FTP
FY 2010 85 FTE/ 90 FTP

Associate Administrator for Commercial Space Transportation

Safety
FY 2009 68 FTE/ 76 FTP
FY 2010 70 FTE/ 76 FTP

Assistant Administrator for Aviation Policy, Planning & Environment

Environment
FY 2009 45 FTE/ 49 FTP
FY 2010 56 FTE/ 57 FTP
Corporate Services
FY 2009 52 FTE/ 57 FTP
FY 2010 55 FTE/ 57 FTP
Total
FY 2009 97 FTE/ 106 FTP
FY 2010 111 FTE/ 114 FTP

Assistant Administrator for Government & Industry Affairs

Corporate Services
FY 2009 12 FTE/ 15 FTP
FY 2010 12 FTE/ 15 FTP

Assistant Administrator for Human Resource Management

Organizational Excellence
FY 2009 112 FTE/ 113 FTP
FY 2010 114 FTE/ 113 FTP
Corporate Services
FY 2009 504 FTE/ 510 FTP
FY 2010 510 FTE/ 510 FTP
Total
FY 2009 616 FTE/ 623 FTP
FY 2010 624 FTE/ 623 FTP

Office of the Chief Counsel

Corporate Services
FY 2009 246 FTE/ 274 FTP
FY 2010 275 FTE/ 284 FTP

Assistant Administrator for Security & Hazardous Materials

Safety
FY 2009 140 FTE/ 157 FTP
FY 2010 142 FTE/ 157 FTP
Security, Preparedness, and Response
FY 2009 325 FTE/ 363 FTP
FY 2010 342 FTE/ 377 FTP
Total
FY 2009 465 FTE/ 520 FTP
FY 2010 484 FTE/ 534 FTP

Assistant Administrator for Communications

Corporate Services
FY 2009 34 FTE/ 40 FTP
FY 2010 34 FTE/ 40 FTP

Assistant Administrator for Information Services

Security, Preparedness, and Response
FY 2009 82 FTE/ 86 FTP
FY 2010 92 FTE/ 96 FTP
Organizational Excellence
FY 2009 19 FTE/ 20 FTP
FY 2010 19 FTE/ 20 FTP
Total
FY 2009 101 FTE/ 106 FTP
FY 2010 111 FTE/ 116 FTP

Assistant Administrator for International Aviation

Global Connectivity
FY 2009 65 FTE/ 68 FTP
FY 2010 65 FTE/ 68 FTP

Assistant Administrator for Financial Services

Organizational Excellence
FY 2009 41 FTE/ 47 FTP
FY 2010 41 FTE/ 51 FTP
Corporate Services
FY 2009 128 FTE/ 149 FTP
FY 2009 127 FTE/ 164 FTP
Total
FY 2009 169 FTE/ 196 FTP
FY 2010 168 FTE/ 215 FTP

Office of the Administrator and Deputy Administrator

Corporate Services
- FY 2009 28 FTE/ 30 FTP
- FY 2010 24_FTE/30 FTP

Assistant Administrator for Regions and Center Operations

Safety
- FY 2009 4 FTE/ 4 FTP
- FY 2010 4 FTE/ 4 FTP

Reduced Congestion
- FY 2009 9 FTE/ 9 FTP
- FY 2010 9 FTE/ 10 FTP

Global Connectivity
- FY 2009 4 FTE/ 4 FTP
- FY 2010 4 FTE/ 4 FTP

Organizational Excellence
- FY 2009 31 FTE/ 32 FTP
- FY 2010 29 FTE/ 32 FTP

Corporate Services
- FY 2009 838 FTE/ 884 FTP
- FY 2010 781 FTE/ 883 FTP

Total
- FY 2009 886 FTE/ 933 FTP
- FY 2010 827 FTE/ 933 FTP

Associate Administrator for Airports

Safety
- FY 2009 158 FTE/ 160 FTP
- FY 2010 166 FTE/ 173 FTP

Reduced Congestion
- FY 2009 281 FTE/ 282 FTP
- FY 2010 282 FTE/ 283 FTP

Global Connectivity
- FY 2009 3 FTE/ 3 FTP
- FY 2010 4 FTE/ 4 FTP

Environment
- FY 2009 82 FTE/ 82 FTP
- FY 2010 82 FTE/ 82 FTP

Security, Preparedness, and Response
- FY 2009 2 FTE/ 2 FTP
- FY 2010 2 FTE/ 2 FTP

Organizational Excellence
- FY 2009 24 FTE/ 29 FTP
- FY 2010 30 FTE/ 30 FTP

Total
- FY 2009 550 FTE/ 558 FTP
- FY 2010 566 FTE/ 574 FTP

Associate Administrator for Aviation Safety

Safety
- FY 2009 6,418 FTE/ 6,917 FTP
- FY 2010 6,516 FTE/ 6,964 FTP

Reduced Congestion
- FY 2009 70 FTE/ 76 FTP
- FY 2010 67 FTE/ 72 FTP

Global Connectivity
- FY 2009 210 FTE/ 227 FTP
- FY 2010 210 FTE/ 224 FTP

Environment
- FY 2009 70 FTE/ 76 FTP
- FY 2010 67 FTE/ 72 FTP

Organizational Excellence
- FY 2009 419 FTE/ 452 FTP
- FY 2010 420 FTE/ 449 FTP

Total
- FY 2009 7,187 FTE/ 7,748 FTP
- FY 2010 7,280 FTE/ 7,781 FTP

Air Traffic Organization

Safety
- FY 2009 30,559 FTE/ 31,634 FTP
- FY 2010 19,418 FTE/ 20,055 FTP

Reduced Congestion
- FY 2009 3,690 FTE/ 4,004 FTP
- FY 2010 10,418 FTE/ 10,943 FTP

Global Connectivity
- FY 2009 23 FTE/ 24 FTP
- FY 2010 31 FTE/ 32 FTP

Environment
- FY 2009 78 FTE/ 84 FTP
- FY 2010 1,122 FTE/ 1,156 FTP

Security, Preparedness, and Response
- FY 2009 44 FTE/ 50 FTP
- FY 2010 54 FTE/ 61 FTP

Organizational Excellence
- FY 2009 385 FTE/ 428 FTP
- FY 2010 3,978 FTE/ 4,117 FTP

Total
- FY 2009 34,779 FTE/ 36,224 FTP
- FY 2010 35,021 FTE/ 36,364 FTP

Total, FAA
FY 2009 45,381 FTE/ 47,600 FTP
FY 2010 45,757 FTE/ 47,857 FTP

EXHIBIT II-1
COMPARATIVE STATEMENT OF NEW BUDGET AUTHORITY
FEDERAL AVIATION ADMINISTRATION
Budget Authority
($000)

ACCOUNTS	FY 2008 ACTUAL	FY 2009 ENACTED (OMNIBUS)	FY 2009 ENACTED (TOTAL)*	FY 2010 REQUEST
Operations	$8,740,000	$9,042,467	$9,042,467	$9,335,798
Facilities and Equipment	$2,513,611	$2,742,095	$2,942,095	$2,925,202
Recovery Act Supplemental (Non-Add)			$200,000	
Research, Engineering and Development	$146,828	$171,000	$171,000	$180,000
Grants-in-Aid for Airports				
Recovery Act Supplemental			$1,100,000	
AATF				
Contract Authority	$3,675,000	$3,900,000	$3,900,000	$3,515,000
Rescission of contract authority	($270,500)	($80,000)	($80,000)	
Subtotal Grants-in Aid	$3,404,500	$3,820,000	$4,920,000	$3,515,000
Obligation Limitation	$3,514,500	$3,514,500	$3,514,500	$3,515,000
Aviation User Fees	$53,363	$27,286	$27,286	$50,000
Aviation User Fees (Transfer to EAS)	($41,566)	($27,286)	($27,286)	($50,000)
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TOTAL	**$14,816,736**	**$15,775,562**	**$17,075,562**	**$15,956,000**

* Includes funding provided by the American Recovery and Reinvestment Act of 2009. This act provides supplemental funding of $200 million to Facilities & Equipment and $1.1 billion to Grants-in-Aid for Airports.

EXHIBIT II-2
FY 2010 BUDGET REQUEST BY APPROPRIATIONS ACCOUNT
FEDERAL AVIATION ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

ACCOUNTS	FY 2008 ACTUAL	FY 2009 ENACTED (OMNIBUS)	FY 2009 ENACTED (TOTAL)*	FY 2010 REQUEST
Operations	**$8,740,000**	**$9,042,467**	**$9,042,467**	**$9,335,798**
Air Traffic Organization (ATO)	6,966,193	7,098,322	7,098,322	7,302,739
Aviation Safety (AVS)	1,081,602	1,164,597	1,164,597	1,216,395
Commercial Space Transportation (AST)	12,549	14,094	14,094	14,737
Staff Offices	679,656	765,454	765,454	801,927
Facilities & Equipment	**$2,513,611**	**$2,742,095**	**$2,942,095**	**$2,925,202**
Engineering, Development, Test and Evaluation	307,478	345,100	345,100	523,915
Air Traffic Control Facilities and Equipment	1,395,662	1,568,290	1,768,290	1,570,871
Non-Air Traffic Control Facilities and Equipment	131,743	141,800	141,800	130,417
Facilities and Equipment Mission Support	218,755	226,405	226,405	230,000
Personnel and Related Expenses	459,973	460,500	460,500	470,000
Research, Engineering & Development	**$146,828**	**$171,000**	**$171,000**	**$180,000**
Improve Aviation Safety	96,526	90,763	90,763	91,085
Improve Efficiency	30,234	43,226	43,226	48,543
Reduce Environmental Impacts	15,469	31,658	31,658	34,992
Mission Support	4,599	5,353	5,353	5,380
Grants-in-Aid for Airports	**$3,514,500**	**$3,514,500**	**$4,614,500**	**$3,515,000**
Grants-in-Aid for Airports	3,395,112	3,384,698	4,482,498	3,384,106
Personnel & Related Expenses	80,676	87,454	89,654	93,422
Airport Technology Research	18,712	19,348	19,348	22,472
Small Community Air Service	10,000	8,000	8,000	0
Airport Cooperative Research Program (ACRP)	10,000	15,000	15,000	15,000
TOTAL:	**$14,914,939**	**$15,470,062**	**$16,770,062**	**$15,956,000**

* Includes funding provided by the American Recovery and Reinvestment Act of 2009. This act provides supplemental funding of $200 million to Facilities & Equipment and $1.1 billion to Grants-in-Aid for Airports.

EXHIBIT II-3
FY 2010 REQUEST BY APPROPRIATION ACCOUNT AND STRATEGIC GOAL
Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

PERFORMANCE MEASURES BY PROGRAM ACTIVITIES	SAFETY	REDUCED CONGESTION	GLOBAL CONNECTIVITY	ENVIRONMENTAL STEWARDSHIP	SECURITY, PREPAREDNESS & RESPONSE	ORG. EXCELLENCE	TOTAL
FY 2010 REQUEST							
OPERATIONS							
AIR TRAFFIC ORGANIZATION (ATO)							
Salaries & Expenses							
A. Reduce the Commercial Air Carrier Fatality Rate	2,422,408						2,422,408
B. Reduce the General Aviation Fatal Accident Rate	1,056,159						1,056,159
C. Increase NAS On-Time Arrival Rate at the 35 OEP Airports		1,392,828					1,392,828
D. Increase Average Daily Airport Capacity for the 35 OEP Airports		1,389,515					1,389,515
E. Expand the Use of NextGen Performance-Based Systems or Concepts in Priority Countries			8,456				8,456
F. FAA's Procurement Goals for Disadvantaged and Women-Owned Businesses			788				788
G. Increase Percentage of DOT Facilities Categorized as No Further Remedial Action				66,452			66,452
H. FAA Activities Supporting the Achievement of DOT's Organizational Excellence Goals						966,134	966,134
Subtotal - ATO Salaries & Expenses	**3,478,567**	**2,782,343**	**9,244**	**66,452**	**0**	**966,134**	**7,302,739**
Aviation Safety (AVS)							
A. Reduce the Commercial Air Carrier Fatality Rate	914,800						914,800
B. Reduce the General Aviation Fatal Accident Rate	175,400						175,400
C. Increase NAS On-Time Arrival Rate at the 35 OEP Airports		11,200					
D. Expand the Use of NextGen Performance-Based Systems or Concepts in Priority Countries			34,395				34,395
E. Reduce Exposure to Significant Aircraft Noise				11,200			11,200
F. FAA Activities Supporting the Achievement of DOT's Organizational Excellence Goals						69,400	69,400
Subtotal - AVS	**1,090,200**	**11,200**	**34,395**	**11,200**	**0**	**69,400**	**1,216,395**
Commercial Space Transportation (AST)							
A. Maintain Zero Commercial Space Transportation Accidents	14,737						14,737
Subtotal - AST	**14,737**	**0**	**0**	**0**	**0**	**0**	**14,737**
Financial Services (ABA)							
A. FAA Activities Supporting the Achievement of DOT's Organizational Excellence Goals						24,310	24,310
Subtotal - ABA	**0**	**0**	**0**	**0**	**0**	**24,310**	**24,310**
Human Resource Management (AHR)							
A. Organizational Excellence - Support PMA Goals						26,681	26,681
Subtotal - AHR	**0**	**0**	**0**	**0**	**0**	**26,681**	**26,681**
Region and Center Operations (ARC)							
A. Reduce the Commercial Air Carrier Fatality Rate	1,428						1,428
B. Increase NAS On-Time Arrival Rate at the 35 OEP Airports		2,821					2,821
C. Expand the Use of NextGen Performance-Based Systems or Concepts in Priority Countries			2,107				2,107
D. FAA Activities Supporting the Achievement of DOT's Organizational Excellence Goals						2,066	2,066
Subtotal - ARC	**1,428**	**2,821**	**2,107**	**0**	**0**	**2,066**	**8,423**
Information Services (AIO)							
A. Security, Preparedness and Response					37,305		37,305
B. Organizational Excellence - Support PMA Goals						12,474	12,474
Subtotal - AIO	**0**	**0**	**0**	**0**	**37,305**	**12,474**	**49,778**
Aviation Policy, Planning & Environment (AEP)							
A. Reduce Exposure to Significant Aircraft Noise				8,069			8,069
B. Increase Percentage of DOT Facilities Categorized as No Further Remedial Action							
C. Organizational Excellence - Support PMA Goals						0	
Subtotal - AEP	**0**	**0**	**0**	**8,069**	**0**	**0**	**8,069**
International Aviation (API)							
A. Expand the Use of NextGen Performance-Based Systems or Concepts in Priority Countries			538				538
B. Promote International Aviation Development Projects			17,786				17,786
Subtotal - API	**0**	**0**	**18,323**	**0**	**0**	**0**	**18,323**
Security and Hazardous Materials (ASH)							
A. Reduce Serious Hazardous Material Incidents	22,989						22,989
B. Security, Preparedness and Response					64,603		64,603
Subtotal - ASH	**22,989**	**0**	**0**	**0**	**64,603**	**0**	**87,591**

EXHIBIT II-3
FY 2010 REQUEST BY APPROPRIATION ACCOUNT AND STRATEGIC GOAL
Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

PERFORMANCE MEASURES BY PROGRAM ACTIVITIES	SAFETY	REDUCED CONGESTION	GLOBAL CONNECTIVITY	ENVIRONMENTAL STEWARDSHIP	SECURITY, PREPAREDNESS & RESPONSE	ORG. EXCELLENCE	TOTAL
Corporate Services							
A. Reduce the Commercial Air Carrier Fatality Rate	220,656						220,656
B. Reduce the General Aviation Fatal Accident Rate	81,510						81,510
C. Reduce Serious Hazardous Material Incidents	1,524						1,524
D. Maintain Zero Commercial Space Transportation Accidents	977						977
E. Increase NAS On-Time Arrival Rate at the 35 OEP Airports		93,248					93,248
F. Increase Average Daily Airport Capacity for the 35 OEP Airports		91,635					91,635
G. Conclude Bilateral Aviation Safety Agreements			1,179				1,179
H. Secure a Yearly Increase in External Funding for Global Safety Initiatives			3,016				3,016
I. FAA's Procurement Goals for Disadvantaged and Women-Owned Businesses			52				52
J. Reduce Exposure to Significant Aircraft Noise				1,153			1,153
K. Increase Percentage of DOT Facilities Categorized as No Further Remedial Action				4,404			4,404
L. Security, Preparedness and Response					6,452		6,452
M.Organizational Excellence - Support PMA Goals						72,947	72,947
Subtotal - Corporate Services	**304,666**	**184,882**	**4,247**	**5,557**	**6,452**	**72,947**	**578,750**
Subtotal Operations	**4,912,586**	**2,981,246**	**68,316**	**91,278**	**108,359**	**1,174,013**	**9,335,798**
FACILITIES AND EQUIPMENT							
Engineering, Development, Test and Evaluation							
A. Reduce the Commercial Air Carrier Fatality Rate	84,600						84,600
B. Reduce the General Aviation Fatal Accident Rate	1,100						1,100
C. Increase Average Daily Airport Capacity for the 35 OEP Airports		415,215					415,215
D. Organizational Excellence - Support PMA Goals						23,000	23,000
Subtotal - Engineering, Development, Test and Evaluation	**85,700**	**415,215**	**0**	**0**	**0**	**23,000**	**523,915**
Air Traffic Control Facilities and Equipment							
A. Reduce the Commercial Air Carrier Fatality Rate	172,871						172,871
B. Reduce the General Aviation Fatal Accident Rate	164,700						164,700
C. Increase NAS On-Time Arrival Rate at the 35 OEP Airports		57,200					57,200
D. Increase Average Daily Airport Capacity for the 35 OEP Airports		1,074,000					1,074,000
E. Increase Percentage of DOT Facilities Categorized as No Further Remedial Action				6,200			6,200
F. Organizational Excellence - Support PMA Goals						64,900	64,900
G. Critical Acquisitions on Schedule						15,500	15,500
H. Critical Acquisitions on Budget						15,500	15,500
Subtotal - Air Traffic Control Facilities and Equipment	**337,571**	**1,131,200**	**0**	**6,200**	**0**	**95,900**	**1,570,871**
Non-Air Traffic Control Facilities and Equiptment							
A. Reduce the Commercial Air Carrier Fatality Rate	38,600						38,600
B. Increase Percentage of DOT Facilities Categorized as No Further Remedial Action				20,000			20,000
C. Security, Preparedness and Response					40,506		40,506
D. Organizational Excellence - Support PMA Goals						23,111	23,111
E. Critical Acquisitions on Schedule						4,100	4,100
F. Critical Acquisitions on Budget						4,100	4,100
Subtotal - Non-Air Traffic Control Facilities and Equipment	**38,600**	**0**	**0**	**20,000**	**40,506**	**31,311**	**130,417**
Facilities and Equiptment Mission Support							
A. Reduce the General Aviation Fatal Accident Rate	10,000						10,000
B. Increase NAS On-Time Arrival Rate at the 35 OEP Airports		116,500					116,500
C. Increase Average Daily Airport Capacity for the 35 OEP Airports		3,600					3,600
D. Organizational Excellence - Support PMA Goals						99,900	99,900
Subtotal - Facilities and Equiptment Mission Support	**10,000**	**120,100**	**0**	**0**	**0**	**99,900**	**230,000**
Personnel and Related Expenses							
A. Reduce the Commercial Air Carrier Fatality Rate	56,598						56,598
B. Reduce the General Aviation Fatal Accident Rate	30,122						30,122
C. Increase NAS On-Time Arrival Rate at the 35 OEP Airports		35,329					35,329
D. Increase Average Daily Airport Capacity for the 35 OEP Airports		282,298					282,298
E. Increase Percentage of DOT Facilities Categorized as No Further Remedial Action				5,329			5,329

EXHIBIT II-3
FY 2010 REQUEST BY APPROPRIATION ACCOUNT AND STRATEGIC GOAL
Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

PERFORMANCE MEASURES BY PROGRAM ACTIVITIES	SAFETY	REDUCED CONGESTION	GLOBAL CONNECTIVITY	ENVIRONMENTAL STEWARDSHIP	SECURITY, PREPAREDNESS & RESPONSE	ORG. EXCELLENCE	TOTAL
F. Security, Preparedness and Response					9,454		9,454
G. Organizational Excellence - Support PMA Goals						42,897	42,897
H. Critical Acquisitions on Schedule						3,987	3,987
I. Critical Acquisitions on Budget						3,987	3,987
Subtotal - Personnel and Related Expenses	**86,720**	**317,627**	**0**	**5,329**	**9,454**	**50,870**	**470,000**
Subtotal - Facilities and Equiptment	**558,591**	**1,984,142**	**0**	**31,529**	**49,960**	**300,981**	**2,925,202**
RESEARCH ENGINEERING AND DEVELOPMENT							
Improve Aviation Safety							
A. Reduce the Commercial Air Carrier Fatality Rate	91,085						91,085
Subtotal - Improve Aviation Safety	**91,085**	**0**	**0**	**0**	**0**	**0**	**91,085**
Improve Efficiency							
A. Increase NAS On-Time Arrival Rate at the 35 OEP Airports		48,543					48,543
Subtotal - Improve Efficiency	**0**	**48,543**	**0**	**0**	**0**	**0**	**48,543**
Reduce Environmental Impacts							
A. Reduce Exposure to Significant Aircraft Noise				34,992			34,992
Subtotal - Reduce Environmental Impacts	**0**	**0**	**0**	**34,992**	**0**	**0**	**34,992**
Mission Support							
A. Reduce the Commercial Air Carrier Fatality Rate	2,735						2,735
B. Increase NAS On-Time Arrival Rate at the 35 OEP Airports		1,567					1,567
C. Reduce Exposure to Significant Aircraft Noise				1,078			1,078
Subtotal - Mission Support	**2,735**	**1,567**	**0**	**1,078**	**0**	**0**	**5,380**
Subtotal - Research, Engineering, & Development	**93,820**	**50,110**	**0**	**36,070**	**0**	**0**	**180,000**
GRANTS-IN-AID FOR AIRPORTS							
Grants-in-Aid for Airports							
A. Reduce the Commercial Air Carrier Fatality Rate	571,759						571,759
B. Reduce the General Aviation Fatal Accident Rate	810,920						810,920
C. Increase Average Daily Airport Capacity for the 35 OEP Airports		1,592,563					1,592,563
D. Reduce Exposure to Significant Aircraft Noise				275,562			275,562
E. Streamline the Completion of Environmental Reviews for DOT-Funded Infrastructure				43,076			43,076
F. Security, Preparedness and Response					90,227		90,227
Subtotal - Grants-in-Aid for Airports	**1,382,679**	**1,592,563**	**0**	**318,638**	**90,227**	**0**	**3,384,106**
Personnel & Related Expenses							
A. Reduce the Commercial Air Carrier Fatality Rate	19,480						19,480
B. Reduce the General Aviation Fatal Accident Rate	15,283						15,283
C. Increase Average Daily Airport Capacity for the 35 OEP Airports		31,232					31,232
D. Expand the Use of NextGen Performance-Based Systems or Concepts in Priority Countries			390				390
E. Reduce Exposure to Significant Aircraft Noise				8,338			8,338
F. Streamline the Completion of Environmental Reviews for DOT-Funded Infrastructure				3,475			3,475
G. Security, Preparedness and Response					1,679		1,679
H. Organizational Excellence - Support PMA Goals						9,362	9,362
I. Major Infrastructure Projects on Schedule						2,092	2,092
J. Major Infrastructure Projects on Budget						2,092	2,092
Subtotal - Personnel & Related Expenses	**34,763**	**31,232**	**390**	**11,813**	**1,679**	**13,546**	**93,422**
Airport Technology Research							
A. Reduce the Commercial Air Carrier Fatality Rate	12,801						12,801
B. Reduce the General Aviation Fatal Accident Rate	424						424
C. Increase Average Daily Airport Capacity for the 35 OEP Airports		9,247					9,247
Subtotal - Airport Technology Research	**13,225**	**9,247**	**0**	**0**	**0**	**0**	**22,472**
Airport Cooperative Research							
A. Reduce the Commercial Air Carrier Fatality Rate	5,000						5,000
B. Increase Average Daily Airport Capacity for the 35 OEP Airports		5,000					5,000
C. Reduce Exposure to Significant Aircraft Noise				5,000			5,000
Subtotal - Airport Cooperative Research	**5,000**	**5,000**	**0**	**5,000**	**0**	**0**	**15,000**
Subtotal - Grants-in-Aid for Airports	**1,435,666**	**1,638,041**	**390**	**335,451**	**91,906**	**13,546**	**3,515,000**
TOTAL REQUEST	**7,000,663**	**6,653,539**	**68,706**	**494,328**	**250,225**	**1,488,540**	**15,956,000**

EXHIBIT II-4
FY 2010 BUDGET REQUEST BY ACCOUNT
FEDERAL AVIATION ADMINISTRATION
Budget Authority
($000)

ACCOUNTS	Mandatory/ Discretionary	FY 2008 ACTUAL	FY 2009 ENACTED (OMNIBUS)	FY 2009 ENACTED (TOTAL)*	FY 2010 REQUEST
Operations	**D**	**$8,740,000**	**$9,042,467**	**$9,042,467**	**$9,335,798**
General		$2,342,939	$3,804,462	$3,804,462	$3,128,000
AATF		$6,397,061	$5,238,005	$5,238,005	$6,207,798
Facilities & Equipment (AATF)	**D**	**$2,513,611**	**$2,742,095**	**$2,942,095**	**$2,925,202**
General		$0	$0	$200,000	$0
AATF		$2,513,611	$2,742,095	$2,742,095	$2,925,202
Research, Engineering & Development (AATF)	**D**	**$146,828**	**$171,000**	**$171,000**	**$180,000**
Grants in Aid for Airports (AATF)		**$3,404,500**	**$3,820,000**	**$4,920,000**	**$3,515,000**
General	**D**			$1,100,000	
AATF					
Contract Authority	**M**	$3,675,000	$3,900,000	$3,900,000	$3,515,000
Rescission	**M**	($270,500)	($80,000)	($80,000)	
Aviation User Fees	**M**	**$53,363**	**$27,286**	**$27,286**	**$50,000**
Aviation User Fees (transfer to EAS)	**M**	**($41,566)**	**($27,286)**	**($27,286)**	**($50,000)**
		---------------	---------------	---------------	---------------
TOTAL:		**$14,816,736**	**$15,775,562**	**$17,075,562**	**$15,956,000**
[Mandatory]		$3,416,297	$3,820,000	$3,820,000	$3,515,000
[Discretionary]		$11,400,439	$11,955,562	$13,255,562	$12,441,000

* Includes funding provided by the American Recovery and Reinvestment Act of 2009. This act provides supplemental funding of $200 million to Facilities & Equipment and $1.1 billion to Grants-in-Aid for Airports.

EXHIBIT II-5
OUTLAYS BY APPROPRIATIONS ACCOUNT
($000)

	FY 2008 ACTUAL	FY 2009 ENACTED (OMNIBUS)	FY 2009 ENACTED (TOTAL)*	FY 2010 REQUEST
Operations	**$8,517,870**	**$9,402,000**	**$9,402,000**	**$9,300,000**
General	$2,120,809	$4,164,000	$4,164,000	$3,092,000
AATF	$6,397,061	$5,238,000	$5,238,000	$6,208,000
Facilities & Equipment	**$2,457,605**	**$2,760,000**	**$2,840,000**	**$2,793,000**
General				
-Discretionary			$80,000	$79,000
AATF	**$2,457,605**	**$2,760,000**	**$2,760,000**	**$2,714,000**
-Discretionary	$2,454,605	$2,736,000	$2,736,000	$2,691,000
-Mandatory	$3,000	$24,000	$24,000	$23,000
Aviation Insurance Revolving Account (M)	**($194,355)**	**($173,000)**	**($173,000)**	**($192,000)**
Research, Engineering (TF) & Development	**$118,568**	**$165,000**	**$165,000**	**$188,000**
Grants-in-Aid for Airports	**$3,808,317**	**$3,498,000**	**$3,608,000**	**$4,156,000**
General				
-Discretionary			$110,000	$660,000
AATF				
-Discretionary	$3,808,317	$3,498,000	$3,498,000	$3,496,000
Franchise Fund	**$10,796**	**$9,000**	**$9,000**	**$94,000**
TOTAL:	**$14,718,801**	**$15,661,000**	**$15,851,000**	**$16,339,000**
[Mandatory]	-$191,355	-$149,000	-$149,000	-$169,000
[Discretionary]	$14,910,156	$15,810,000	$16,000,000	$16,508,000

* Includes funding provided by the American Recovery and Reinvestment Act of 2009. This act provides supplemental funding of $200 million to Facilities & Equipment and $1.1 billion to Grants-in-Aid for Airports.

Federal Aviation Administration
FY 2010 President's Budget Submission

SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
FEDERAL AVIATION ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

OPERATIONS

	2009 Enacted	2009 PC&B By Program	2009 # FTE Per Program	2009 Contracts Expenses	Annualization of FY 2009 Hiring	Annualization of 2009 Pay Raises	2010 Pay Raises	GSA Rent	WCF Increase/ Decrease	Inflation/ Deflation	FY 2010 Adjusted Base	Program Increases/ Decreases	2010 PC&B Program Increase	2010 # FTE Per Program Increase	2010 Contract Expense Program Increases	* FY 2010 Request
		Note Non-Add											Note Non-Add			
PERSONNEL RESOURCES (FTE)	41,697															
Direct FTE	41,697				255						41,952	100				**42,052**
FINANCIAL RESOURCES																
ADMINISTRATIVE EXPENSES																
Salaries and Benefits	$6,289,352	$6,289,352			$26,555	$69,466	$165,970				6,551,343	$19,074	$0	---		$6,570,417
Travel	$159,092	---	---							$795	159,887	$0	---	---		$159,887
Transportation	$23,387	---	---							$117	23,504	$0	---	---		$23,504
GSA Rent	$127,079	---	---					$6,325			133,404		---	---		$133,404
Rental Payments to Others	$31,174									$156	31,330					$31,330
Communications, Rent & Utilities	$333,707	---	---							$1,669	335,376	($8,700)	---	---		$326,676
Printing	$6,828	---	---							$34	6,862	$0	---	---		$6,862
Other Services:																
-WCF	$28,377	---	---	$28,377					$2,487		30,864		---	---		$30,864
-Advisory and Assistance Services	$485,166			$485,166						$2,426	487,592					$487,591
-Other	$1,342,872	---	---	$1,342,872						$4,953	1,347,825	$24,283	$0	$0	$0	$1,372,108
Supplies	$129,844	---	---							$649	130,493	($23,306)	---	---		$107,187
Equipment	$75,566	---	---							$378	75,944	$0	---	---		$75,943
Lands and Structures	$2,610										2,610					$2,610
Grants, Claims and Subsidies	$2,664										2,664					$2,664
Insurance Claims and Indemnities	$4,225										4,225					$4,225
Interest and Dividends	$524										524					$524
Admin Subtotal	**$9,042,467**	**$6,289,352**	**$0**	**$1,856,415**	**$26,555**	**$69,466**	**$165,970**	**$6,325**	**$2,487**	**$11,177**	**$9,324,447**	**$11,351**	**$0**	**$0**	**$0**	**$9,335,798**
PROGRAMS																
Air Traffic Organization (ATO)	$7,098,322	$5,019,388	$0	$1,435,569	$13,129	$56,242	$134,845		$1,034	$9,260	$7,312,833	**($10,094)**				$7,302,739
Aviation Safety (AVS)	$1,164,597	$925,492	$0	$154,972	$13,156	$9,427	$22,059		($74)	$1,270	$1,210,436	$5,960				$1,216,395
Commercial Space Transportation (AST)	$14,094	$9,300	$0	$3,856	$270	$104	$247		$0	$24	$14,739					$14,739
Staff Offices	$765,454	$335,172	$0	$262,018	$0	$3,693	$8,819	$6,325	$1,527	$623	$786,442	$15,485				$801,927
Programs Subtotal	**$9,042,467**	**$6,289,352**	**$0**	**$1,856,415**	**$26,555**	**$69,466**	**$165,970**	**$6,325**	**$2,487**	**$11,177**	**$9,324,449**	**$11,351**				**$9,335,798**
GRAND TOTAL	**$9,042,467**	**$6,289,352**	**$0**	**$1,856,415**	**$26,555**	**$69,466**	**$165,970**	**$6,325**	**$2,487**	**$11,177**	**$9,324,449**	**$11,351**	**$0**	**$0**	**$0**	**$9,335,798**

***Due to the difference with the Schedule O in MAX, FAA will do a Budget errata explanation and change what is in MAX system to match Exhibit II**

Federal Aviation Administration
FY 2010 President's Budget Submission

EXHIBIT II-6

SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
FEDERAL AVIATION ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

FACILITIES & EQUIPMENT

	2009 Enacted	2009 PC&B By Program	2009 # FTE Per Program	2009 Contracts Expenses	Annualization of FY 2009 Hiring	Annualization of 2009 Pay Raises	2010 Pay Raises	GSA Rent	WCF Increase/ Decrease	Inflation/ Deflation	FY 2010 Adjusted Base	Program Increases/ Decreases	2010 PC&B Program Increase	2010 # FTE Per Program Increase	2010 Contract Expense Program Increases	FY 2010 Request
		Note Non-Add											Note Non-Add			
PERSONNEL RESOURCES (FTE)	2,886															
Direct FTE	2,831										2,831	0				2,831
Reimbursable FTE	55										55	0				55
FINANCIAL RESOURCES																
ADMINISTRATIVE EXPENSES																
Salaries and Benefits	$411,000	$411,000			---	$4,066	$5,229				$420,295	$0	$0	---		$420,295
Travel	$35,000	---	---							$155	$35,155	$0	---	---		$35,155
Transportation	$3,004	---	---							$69	$3,073	$0	---	---		$3,073
GSA Rent	$0	---	---					---			$0		---	---		$0
Rental Payments to Others	$32,000									$1,929	$33,929					$33,929
Communications, Rent & Utilities	$38,000	---	---							$2,576	$40,576	$0	---	---		$40,576
Printing	$727	---	---							$16	$743	$0	---	---		$743
Other Services:	$1,721,364			$1,721,364						$134,432	$1,855,796					$1,855,796
-WCF	$0	---	---						---		$0		---	---		$0
-Advisory and Assistance Services	$0										$0					$0
-Other	$0	---	---								$0	$0	$0	$0	$0	$0
Supplies	$40,000	---	---							$2,660	$42,660	$0	---	---		$42,660
Equipment	$290,000	---	---							$19,826	$309,826	$0	---	---		$309,826
Lands and Structures	$166,000									$11,575	$177,575					$177,575
Grants, Claims and Subsidies	$5,000									$574	$5,574					$5,574
Insurance Claims and Indemnities	$0										$0					$0
Interest and Dividends	$0										$0					$0
Admin Subtotal	**$2,742,095**	**$411,000**	**0**	**$1,721,364**	**$0**	**$4,066**	**$5,229**	**$0**	**$0**	**$173,812**	**$2,925,202**	**$0**	**$0**	**0**	**$0**	**$2,925,202**
PROGRAMS																
Engineering, Development, Test and Evaluation	$345,100	---	---	$262,000						$178,814	$523,914					$523,914
Air Traffic Control Facilities and Equipment	$1,568,290	---	---	$1,200,000						$2,581	$1,570,871					$1,570,871
Non-Air Traffic Control Facilities and Equipment	$141,800	---	---	$136,000						($11,383)	$130,417					$130,417
Facilities and Equipment Mission Support	$226,405	---	---	$123,364						$3,595	$230,000					$230,000
Personnel & Related Expenses	$460,500	$411,000	---	---		$4,066	$5,229			$205	$470,000					$470,000
Programs Subtotal	**$2,742,095**	**$411,000**		**$1,721,364**	**$0**	**$4,066**	**$5,229**	**$0**	**$0**	**$173,812**	**$2,925,202**	**$0**				**$2,925,202**
GRAND TOTAL	**$2,742,095**	**$411,000**	**$0**	**$1,721,364**	**$0**	**$4,066**	**$5,229**	**$0**	**$0**	**$173,812**	**$2,925,202**	**$0**	**$0**	**$0**	**$0**	**$2,925,202**

Federal Aviation Administration
FY 2010 President's Budget Submission

EXHIBIT II-6
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE

FEDERAL AVIATION ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)
RESEARCH, ENGINEERING, & DEVELOPMENT

	2009 Enacted	2009 PC&B by Program	2009 FTE by Program	2009 Contracts Expenses	Annualization of 2009 Hiring	Annualization of 2009 Pay Raises	2010 Pay Raises	GSA Rent	WCF Increase/ Decrease	Inflation/ Deflation	FY 2009 Adjusted Base	Program Increases/Decreases	2010 PC&B Program Increase	2010 # FTE Per Program Increase	2010 Contract Expense Program Increase	FY 2010 Request
			Note Non-Add											Note Non-Add		
PERSONNEL RESOURCES (FTE)	303										303			5		308
Direct FTE	303										303			5		308
FINANCIAL RESOURCES																
Salaries and Benefits	$43,215	$43,215	303		$190	$560	$1,674				$45,639	$750	$750	5		$46,389
Benefits for Former Personnel	$0										$0					$0
Travel	$1,844										$1,844					$1,844
Transportation	$100										$100					$100
GSA Rent	$0										$0					$0
Rental Payments to Others	$0										$0					$0
Communications, Rent & Utilities	$115										$115					$115
Printing	$0										$0					$0
Other Services:	$0										$0					$0
-WCF	$0										$0					$0
-Advisory and Assistance Services	$0										$0					$0
-Other	$103,226			$103,226						$85	$103,311	$5,741			$5,741	$109,052
Supplies	$2,000										$2,000					$2,000
Equipment	$4,500										$4,500					$4,500
Lands and Structures	$0										$0					$0
Grants, Claims & Subsidies	$16,000										$16,000					$16,000
Insurance Claims and Indemnities	$0										$0					$0
Interest & Dividends	$0										$0					$0
Admin Subtotal	**$171,000**	**$43,215**	**303**	**$103,226**	**$190**	**$560**	**$1,674**	**$0**	**$0**	**$85**	**$173,509**	**$6,491**	**$750**	**5**	**$5,741**	**$180,000**
PROGRAMS																
Improve Aviation Safety	$90,763	$34,087	239	$45,776			$288			$33	$91,084	$1			$1	$91,085
Improve Aviation Efficiency	$43,226	$2,917	19	$31,612	$190	$410	$1,023			$44	$44,893	$3,650	$600		$3,050	$48,543
Reduce Environmental Impact	$31,658	$4,072	30	$23,963		$150	$351			$6	$32,165	$2,827	$150		$2,677	$34,992
Mission Support	$5,353	$2,139	15	$1,875			$12			$2	$5,367	$13			$13	$5,380
Programs Subtotal	**$171,000**	**$43,215**	**303**	**103,226**	**$190**	**$560**	**$1,674**	**$0**	**$0**	**$85**	**$173,509**	**$6,491**	**$750**		**$5,741**	**$180,000**
GRAND TOTAL	**$171,000**	**$43,215**	**$303**	**$103,226**	**$190**	**$560**	**$1,674**	**$0**	**$0**	**$85**	**$173,509**	**$6,491**	**$750**	**5**	**$5,741**	**$180,000**

Federal Aviation Administration
FY 2010 President's Budget Submission

EXHIBIT II-6
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE

FEDERAL AVIATION ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

GRANTS-IN-AID FOR AIRPORTS

	2009 Enacted	2009 PC&B by Program	2009 FTE by Program	2009 Contracts Expenses	Annualization of 2009 Hiring	Annualization of 2009 Pay Raises	2010 Pay Raises	GSA Rent	WCF Increase/ Decrease	Inflation/ Deflation	FY 2010 Adjusted Base	Program Increases/Decreases	2010 PC&B Program Increase	2010 # FTE Per Program Increase	2010 Contract Expense Program Increases	FY 2010 Request
			Note Non-Add											Note Non-Add		
PERSONNEL RESOURCES (FTE)																
Direct FTE	550				8.0						558.0	8				566.0
FINANCIAL RESOURCES																
Salaries and Benefits	$72,938	$72,938	550.0		$1,205	$993	$1,955				$77,091	$1,040	$1,040			$78,131
Benefits for Former Personnel	$0										$0					$0
Travel	$4,765									$38	$4,803					$4,803
Transportation	$120									$1	$121					$121
GSA Rent	$0									$0	$0					$0
Rental Payments to Others	$562									$4	$566					$566
Communications, Rent & Utilities	$136									$1	$137					$137
Printing	$70									$1	$71					$71
Other Services:	$0										$0	$3,729			$3,729	$3,729
-WCF	$0									$0	$0					$0
-Advisory and Assistance Services	$0									$0	$0					$0
-Other	$39,107			$39,107						$115	$39,222					$39,221
Supplies	$1,210									$10	$1,220					$1,220
Equipment	$2,895										$2,895					$2,895
Lands and Structures	$0										$0					$0
Grants, Claims and Subsidies	$3,392,698										$3,392,698	($8,592)				$3,384,106
Insurance Claims and Indemnities	$0										$0					$0
Interest & Dividends	$0										$0					$0
Admin Subtotal	**$3,514,500**	**$72,938**	**550.0**	**$39,107**	**$1,205**	**$993**	**$1,955**	**$0**	**$0**	**$170**	**$3,518,824**	**($3,823)**	**$1,040**	**$0**	**$3,729**	**$3,515,000**
PROGRAMS																
Grants-in-aid for Airports	$3,384,698	$0	0.0	$0							$3,384,698	($592)				$3,384,106
Personnel and Related Expenses	$87,454	$69,623	527.5	$9,508	$1,129	$945	$1,860			$96	$91,484	$1,938				$93,422
Airport Technology Research	$19,348	$3,149	21.5	$14,815	$76	$46	$91			$80	$19,642	$2,831				$22,472
Airport Cooperative Research	$15,000	$166	1.0	$14,784		$2	$4			($6)	$15,000	$0				$15,000
Small Community Development Program	$8,000		0.0								$8,000	($8,000)				$0
Programs Subtotal	**$3,514,500**	**$72,938**	**550.0**	**$39,107**	**$1,205**	**$993**	**$1,955**	**$0**	**$0**	**$170**	**$3,518,824**	**($3,823)**				**$3,515,000**
GRAND TOTAL	**$3,514,500**				**$1,205**	**$993**	**$1,955**	**$0**	**$0**	**$170**		**($3,823)**				**$3,515,000**

EXHIBIT II-6A

WORKING CAPITAL FUND
FEDERAL AVIATION ADMINISTRATION
Appropriations, Obligation Limitations, Exempt Obligations and Reimbursable Obligations

	FY 2009 ENACTED	FY 2010 REQUEST	CHANGE
DIRECT:			
Operations	**28,376,539**	**30,863,523**	**30,863,523**
Air Traffic Organization (ATO)	8,640,833	9,674,720	9,674,720
Aviation Safety (AVS)	2,118,120	2,043,604	2,043,604
Commercial Space Transportation (AST)	-	-	-
Staff Offices	17,617,586	19,145,199	19,145,199
TOTAL	**28,376,539**	**30,863,523**	**2,486,984**

EXHIBIT II-7
PERSONNEL RESOURCE -- SUMMARY
TOTAL FULL-TIME EQUIVALENTS

	FY 2008 ACTUAL	FY 2009 ENACTED	FY 2010 REQUEST
DIRECT FUNDED BY APPROPRIATION			
Operations	40,794	41,697	42,052
Aviation Insurance Revolving Fund	5	5	5
Facilities & Equipment	2,643	2,831	2,831
Research, Engineering & Development	263	303	308
Grants-in-Aid for Airports	518	550	566
SUBTOTAL, DIRECT FUNDED	**44,223**	**45,386**	**45,762**
REIMBURSEMENTS/ALLOCATIONS			
Operations	270	156	156
Facilities & Equipment	48	55	55
Grants-in-Aid for Airports	2	6	6
Administrative Services Franchise Fund	1,354	1,380	1,452
SUBTOTAL, REIMBURSE./ALLOC.	**1,674**	**1,597**	**1,669**
TOTAL FTEs	**45,897**	**46,983**	**47,431**

EXHIBIT II-8
RESOURCE SUMMARY - STAFFING
FULL-TIME PERMANENT POSITIONS

	FY 2008 ACTUAL	FY 2009 ENACTED	FY 2010 REQUEST
DIRECT FUNDED BY APPROPRIATION			
Operations	43,455	43,553	43,794
Aviation Insurance Revolving Fund	5	5	5
Facilities & Equipment	3,234	3,181	3,181
Research, Engineering & Development	298	308	308
Grants-in-Aid for Airports	538	558	574
SUBTOTAL, DIRECT FUNDED	**47,530**	**47,605**	**47,862**
REIMBURSEMENTS/ALLOCATIONS			
Operations	156	300	300
Facilities & Equipment	55	55	55
Grants-in-Aid for Airports	4	4	4
Administrative Services Franchise Fund	1,380	1,566	1,566
SUBTOTAL, REIMBURSE./ALLOC.	**1,595**	**1,925**	**1,925**
TOTAL	**49,125**	**49,530**	**49,787**

Note: Figures reflect authorized positions (FTP) approved by Congress. FAA does not intend to staff to these levels in FY 2010.

OPERATIONS

For necessary expenses of the Federal Aviation Administration, not otherwise provided for, including operations and research activities related to commercial space transportation, administrative expenses for research and development, establishment of air navigation facilities, the operation (including leasing) and maintenance of aircraft, subsidizing the cost of aeronautical charts and maps sold to the public, lease or purchase of passenger motor vehicles for replacement only, in addition to amounts made available by Public Law 108-176, $9,335,798,000, of which $6,207,798,000 shall be derived from the Airport and Airway Trust Fund: Provided, That not to exceed 2 percent of any budget activity, except for aviation safety budget activity, may be transferred to any budget activity under this heading: Provided further, That no transfer may increase or decrease any appropriation by more than 2 percent: Provided further, That any transfer in excess of 2 percent shall be treated as a reprogramming of funds under section 405 of this Act and shall not be available for obligation or expenditure except in compliance with the procedures set forth in that section: Provided further, That funds may be used to enter into a grant agreement with a nonprofit standard-setting organization to assist in the development of aviation safety standards: Provided further, That none of the funds in this Act shall be available for new applicants for the second career training program: Provided further, That there may be credited to this appropriation as offsetting collections funds received from States, counties, municipalities, foreign authorities, other public authorities, and private sources, including funds from fees authorized under Chapter 453 of title 49, United States Code, other than those authorized by Section 45301(a)(1) of that title, which shall be available for expenses incurred in the provision of agency services, including receipts for the maintenance and operation of air navigation facilities, and for issuance, renewal or modification of certificates, including airman, aircraft, and repair station certificates, or for tests related thereto, or for processing major repair or alteration forms.

Program and Financing (in millions of dollars)

Identification code: 69-1301-0-1-402		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Obligations by program activity:			
	Direct program:			
00.01	Air Traffic Organization (ATO)	6,987	7,098	7,303
00.04	Regulation and Certification	1,087	1,165	1,216
00.05	Commercial Space Transportation	12	14	15
00.06	Staff Offices.	677	765	802
01.00	Direct Program Activities Subtotal	8,763	9,042	9,336
09.01	Reimbursable program	180	246	246
10.00	Total new obligations	8,943	9,288	9,582
	Budget resources available for obligation:			
21.40	Unobligated balance carried forward, start of year	84	29	....
22.00	New budget authority (gross)	8,887	9,259	9,582
22.10	Resources available from recoveries of prior year obligations	7	....	....
23.90	Total budgetary resources available for obligation	8,978	9,288	9,582
23.95	Total new obligations	-8,943	-9,288	-9,582
23.98	Unobligated balance expiring or withdrawn	-6	....	....
24.40	Unobligated balance carried forward, end of year	29	....	....
	New budget authority (gross), detail:			
	Discretionary:			
40.00	Appropriation	2,343	3,804	3,128
	Spending authority from offsetting collections:			
	Discretionary:			
58.00	Offsetting collections (cash)	6,502	5,455	6,454
58.10	Change in uncollected customer payments from Federal sources (unexpired)	42	....	....
58.90	Spending authority from offsetting collections (total discretionary)	6,544	5,455	6,454
70.00	Total new budget authority (gross)	8,887	9,259	9,582
	Change in obligated balances:			
72.40	Obligated balance, start of year	1,107	1,414	1,083
73.10	Total new obligations	8,943	9,288	9,582
73.20	Total outlays (gross)	-8,676	-9,619	-9,546
73.40	Adjustments in expired accounts (net)	-8	....	....
73.45	Recoveries of prior year obligations	-7	....	....
74.00	Change in uncollected customer payments from Federal sources (unexpired)	-42	....	....
74.10	Change in uncollected customer payments from Federal sources (expired)	97	....	....
74.40	Obligated balance, end of year	1,414	1,083	1,119
	Outlays (gross), detail:			
86.90	Outlays from new discretionary authority	7,603	8,176	8,463
86.93	Outlays from discretionary balances	1,073	1,443	1,083
87.00	Total outlays (gross)	8,676	9,619	9,546
	Offsets:			
	Against gross budget authority and outlays:			
	Offsetting collections (cash) from:			
88.00	Federal sources	6,534	5,440	6,439
88.40	Non-Federal sources	21	15	15
88.90	Total, offsetting collections (cash)	6,555	5,455	6,454

	Against gross budget authority only:			
88.95	Change in uncollected customer payments from Federal sources (unexpired)	42	....	....
88.96	Portion of offsetting collections (cash) credited to expired accounts	-53	....	....
	Net budget authority and outlays:			
89.00	Budget authority...	2,343	3,804	3,128
90.00	Outlays	2,121	4,164	3,092

For 2010, the Budget requests $9,336 million for FAA operations. These funds will be used to continue to promote aviation safety and efficiency. The Budget provides funding for the Air Traffic Organization (ATO) which is responsible for managing the air traffic control system. As a performance-based organization, the ATO is designed to provide cost-effective, efficient, and, above all, safe air traffic services. The Budget also funds the Aviation Safety Organization (AVS) which ensures the safe operation of the airlines and certifies new aviation products. In addition, the request also funds regulation of the commercial space transportation industry, as well as FAA policy oversight and overall management functions.

Object Classification (in millions of dollars)

Identification code: 69-1301-0-1-402		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Direct obligations:			
	Personnel compensation:			
11.1	Full-time permanent...	4,089	4,426	4,476
11.3	Other than full-time permanent	43	43	43
11.5	Other personnel compensation	380	381	382
11.9	Total personnel compensation	4,512	4,850	4,901
12.1	Civilian personnel benefits..	1,407	1,440	1,490
13.0	Benefits for former personnel	1	1	1
21.0	Travel and transportation of persons.................................	162	159	162
22.0	Transportation of things...	24	23	24
23.1	Rental payments to GSA..	127	127	129
23.2	Rental payments to others	29	31	32
23.3	Communications, utilities, and miscellaneous charges	345	334	346
24.0	Printing and reproduction...	7	7	7
25.1	Advisory and assistance services.......................................	489	485	484
25.2	Other services	1,435	1,369	1,533
26.0	Supplies and materials	136	130	137
31.0	Equipment..	79	76	80
32.0	Land and structures	3	3	3
41.0	Grants, subsidies, and contributions..................................	3	3	3
42.0	Insurance claims and indemnities	4	4	4
99.0	Direct obligations...	8,763	9,042	9,336
99.0	Reimbursable obligations..	180	246	246
99.9	Total new obligations...	8,943	9,288	9,582

Employment Summary

Identification code: 69-1301-0-1-402		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Direct:			
10.01	Total compensable work years: Full-time equivalent employment	40,794	41,697	42,052
	Reimbursable:			
20.01	Total compensable work years: Full-time equivalent employment	270	156	156

EXHIBIT III-1

OPERATIONS

Summary by Program Activity
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

	FY 2008 ACTUAL	FY 2009 ENACTED	FY 2010 REQUEST	CHANGE FY 2009-2010
Air Traffic Organization (ATO)	6,966,193	7,098,322	7,302,739	204,417
Aviation Safety (AVS)	1,081,602	1,164,597	1,216,395	51,798
Commercial Space (AST)	12,549	14,094	14,737	643
Staff Offices	679,656	765,454	801,927	36,473
TOTAL	**8,740,000**	**9,042,467**	**9,335,798**	**293,331**
FTEs				
Direct Funded	40,794	41,697	42,052	355
Reimbursable, allocated, other	270	156	156	0

Program and Performance Statement

This account provides funds for the operation, maintenance, communications, and logistical support of the air traffic control and air navigation systems. It also covers administrative and managerial costs for the FAA's regulatory, international, medical, engineering and development programs as well as policy oversight and overall management functions. The operations appropriation includes the following major activities:

(1) operation on a 24-hour daily basis of a national air traffic system;
(2) establishment and maintenance of a national system of aids to navigation;
(3) establishment and survellance of civil air regulations to assure safety in aviation;
(4) development of standards, rules and regulations governing the physical fitness of airmen as well as the administration of an aviation medical research program;
(5) regulation of the commercial space transportation industry;
(6) administration of acquisition programs; and
(7) headquarters, administration and other staff offices.

EXHIBIT III-2

OPERATIONS

SUMMARY ANALYSIS OF CHANGE FROM FY 2009 TO FY 2010

Appropriations, Obligation Limitations, and Exempt Obligations

Item	Change from FY 2009 to FY 2010	FY 2010 PC&B by Program	FY 2010 FTEs by Program	FY 2010 Contract Expenses	Total
		Note Columns are Non-Add			
FY 2009 Base (Enacted)					
Operations Appropriations, Obligations, Limitations, and Exempt Obligations		**$6,289,352**	**41,697**	**$1,856,423**	**$9,042,467**
Adjustments to Base					
FY 2009 One-Time Items	-20,226			-20,226	
Annualized FTEs	26,555	26,555	255		
Annualized FY 2009 Pay Raise (GS Population)	8,963	8,963			
Annualized FY 2009 Pay Raise (Core Comp Population)	60,503	60,503			
FY 2010 Pay Raise (GS Population)	20,522	20,522			
FY 2010 OSI (Core Comp Population)	120,205	120,205			
FY 2010 SCI	25,243	25,243			
Non-pay Inflation	13,664			9,866	
GSA Rent Increase	6,325				
NAS Handoff Requirements	42,636			42,636	
DOL Wage Determination Increases	9,352			9,352	
Cost Efficiencies	-48,006			-16,000	
Base Transfers	0	0	-59		
Subtotal, Adjustments to Base	**$265,736**	**$261,991**	**196**	**$25,628**	**$265,736**
New or Expanded Programs					
Air Traffic Controller Hiring	4,548	4,548	53		
NextGen Staffing Increase	7,000	7,000	52		
UAS / Drug Inspection Staffing	2,604	2,604	15		
AVS Analytical Program Staff Increases	480	480	3		
ASIAS Contract Support	3,720			3,720	
NextGen Environmental/Noise	1,665	960	5	921	
Congestion Studies	216		3		
National Security Systems Classified/Contolled Info	1,300	1,080	9	220	
National Security Coordination Division/Counter Intel	713	633	5	80	
Equal Employment Opportunity and Civil Rights Programs	692	692	7		
FAA Privacy Program	2,557	1,077	7	1,480	
Automated Staffing and Application Process (ASAP)	500			500	
Financial Systems Upgrade	1,600			1,600	
Subtotal, New or Expanded Programs	**$27,595**	**$19,074**	**159**	**$8,521**	**$27,595**
Total FY 2010 Request	**$293,331**	**$6,570,417**	**42,052**	**$1,890,573**	**$9,335,798**

OPERATIONS APPROPRIATION

Operations Summary
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2009 Enacted (Omnibus)	**9,042,467**	**40,983**	**1,228**	**41,697**
FY 2009 One-Time Items	**-20,226**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	26,555	17	0	255
2. Annualized FY 2009 Pay Raise (GS Population)	8,963	0	0	0
3. Annualized FY 2009 Pay Raise (Core Comp Population)	60,503	0	0	0
4. January 2010 Pay Raise (GS Population)	20,522	0	0	0
5. January 2010 OSI (Core Comp Population)	120,205	0	0	0
6. January 2010 SCI	25,243	0	0	0
7. Non-pay inflation	13,664	0	0	0
8. GSA Rent Increase	6,325	0	0	0
Total Unavoidable Adjustments	**281,980**	**17**	**0**	**255**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	42,636	0	0	0
2. DOL Wage Determination Increases	9,352	0	0	0
Total Uncontrollable Adjustments	**51,988**	**0**	**0**	**0**
Discretionary Increases				
1. Air Traffic Controller Hiring	4,548	107	0	53
2. NextGen Staffing Increase	7,000	104	0	52
3. UAS / Drug Inspector Staffing	2,604	30	0	15
4. AVS Analytical Program Staff	480	6	0	3
5. ASIAS Contract Support	3,720	0	0	0
6. NextGen Environmental/Noise	1,665	5	0	5
7. Congestion Studies	216	3	0	3
8. National Security Systems Classified/ Controlled Information	1,300	9	0	9
9. National Security Coordination Division/ Counter Intelligence	713	5	0	5
10. Equal Employment Opportunity (EEO) and Civil Rights Programs	692	7	0	7
11. FAA Privacy Program	2,557	7	0	7
12. Automated Staffing and Processing (ASAP)	500	0	0	0
13. Financial Systems Upgrades	1,600	0	0	0
Total Discretionary Increases	**27,595**	**283**	**0**	**159**
Cost Efficiencies				
1. Rents, Utilities, and Leases	-8,700	0	0	0
2. Service Center Business Process Reengineering	-16,000	0	0	0
3. Administrative Overhead Efficiencies	-23,306	0	0	0
Total Cost Efficiencies	**-48,006**	**0**	**0**	**0**
Base Transfers				
1. Air Traffic Controller Hiring Support	0	0	0	0
2. Automated Staffing and Application Process (ASAP) System Enhancements	0	0	0	0
3. Labor Relations Improvements	0	0	0	0
4. Technical Library	0	0	0	0
5. Office of Audit and Evaluation	0	0	0	0
6. Panorama Business Views (PB Views)	0	0	0	0
7. Tech Ops Hiring	0	0	0	0
8. Litigation Support	0	0	0	0
9. Emergency Communications	0	0	0	0
10. FAA Historian	0	0	0	0
11. Clinical Psychologist	0	0	0	0
12. Acquisition Support (AMQ) to Franchise Fund	0	-59	0	-59
Total Base Transfers	**0**	**-59**	**0**	**-59**
FY 2010 Request	**9,335,798**	**41,224**	**1,228**	**42,052**

OPERATIONS APPROPRIATION

FY 2010 Base Transfer Summary
(Whole dollars)

Title	From	To	PC&B	Other Objects	Total	FTE	EOY
1. Air Traffic Controller Hiring Support	ATO	AHR	330,900	0	330,900	4	4
2. Automated Staffing and Application Process (ASAP) System Enhancements	ATO	AHR	147,500	0	147,500	1	1
3. Labor Relations Improvements	AVS	AHR	157,700	0	157,700	1	1
4. Technical Library	ATO	AGC	222,040	429,000	651,040	2	2
5. Office of Audit and Evaluation	See Below	AGC	1,421,860	0	1,421,860	11	11
	AOA	AGC	561,940	0	561,940	4	4
	ABA	AGC	166,733	0	166,733	1	1
	AVS	AGC	693,182	0	693,182	6	6
6. Panorama Business Views (PB Views)	See Below	AEP	0	1,196,620	1,196,620	0	0
	ATO	AEP	0	962,894	962,894	0	0
	AVS	AEP	0	149,244	149,244	0	0
	AST	AEP	0	1,731	1,731	0	0
	ABA	AEP	0	13,880	13,880	0	0
	AHR	AEP	0	12,586	12,586	0	0
	ARC	AEP	0	32,090	32,090	0	0
	AIO	AEP	0	5,334	5,334	0	0
	ACR	AEP	0	1,290	1,290	0	0
	AGC	AEP	0	5,379	5,379	0	0
	API	AEP	0	2,209	2,209	0	0
	ASH	AEP	0	9,983	9,983	0	0
7. Tech Ops Hiring	ATO	AHR	173,400	276,200	449,600	2	2
8. Litigation Support	ATO	AGC	800,000	1,200,000	2,000,000	5	9
9. Emergency Communications	ATO	ASH	513,566	0	513,566	5	5
10. FAA Historian	ATO	AGC	175,400	9,000	184,400	1	1
11. Clinical Psychologist	ATO	AVS	149,200	7,065	156,265	1	1
12. Acquisition Support (AMQ) to Franchise Fund	ARC	ARC/FF	0	0	0	-59	-59

OPERATIONS APPROPRIATION

Air Traffic Organization (ATO)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2009 Enacted (Omnibus)	**7,098,322**	**31,036**	**1,030**	**31,842**
FY 2009 One-Time Items	**-20,226**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	13,129			153
2. Annualized FY 2009 Pay Raise (GS Population)	3,138			
3. Annualized FY 2009 Pay Raise (Core Comp Population)	53,104			
4. January 2010 Pay Raise (GS Population)	7,184			
5. January 2010 OSI (Core Comp Population)	105,505			
6. January 2010 SCI	22,156			
7. Non-pay inflation	10,294			
8. GSA Rent Increase	0			
Total Unavoidable Adjustments	**214,509**	**0**	**0**	**153**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	42,636			
2. DOL Wage Determination Increases	9,352			
Total Uncontrollable Adjustments	**51,988**	**0**	**0**	**0**
Discretionary Increases				
1. Air Traffic Controller Hiring	4,548	107		53
2. NextGen Staffing Increase	7,000	104		52
3. UAS / Drug Inspector Staffing	0			
4. AVS Analytical Program Staff	0			
5. ASIAS Contract Support	0			
6. NextGen Environmental/Noise	0			
7. Congestion Studies	0			
8. National Security Systems Classified/ Controlled Information	0			
9. National Security Coordination Division/ Counter Intelligence	0			
10. Equal Employment Opportunity (EEO) and Civil Rights Programs	0			
11. FAA Privacy Program	0			
12. Automated Staffing and Processing (ASAP)	0			
13. Financial Systems Upgrades	0			
Total Discretionary Increases	**11,548**	**211**	**0**	**105**
Cost Efficiencies				
1. Rents, Utilities, and Leases	-8,700			
2. Service Center Business Process Reengineering	-16,000			
3. Administrative Overhead Efficiencies	-23,306			
Total Cost Efficiencies	**-48,006**	**0**	**0**	**0**
Base Transfers				
1. Air Traffic Controller Hiring Support	-331	-4		-4
2. Automated Staffing and Application Process (ASAP) System Enhancements	-148	-1		-1
3. Labor Relations Improvements	0			
4. Technical Library	-651	-2		-2
5. Office of Audit and Evaluation	0			
6. Panorama Business Views (PB Views)	-963			
7. Tech Ops Hiring	-450	-2		-2
8. Litigation Support	-2,000	-9		-5
9. Emergency Communications	-514	-5		-5
10. FAA Historian	-184	-1		-1
11. Clinical Psychologist	-156	-1		-1
12. Acquisition Support (AMQ) to Franchise Fund	0			
Total Base Transfers	**-5,396**	**-25**	**0**	**-21**
FY 2010 Request	**7,302,739**	**31,222**	**1,030**	**32,079**

Detailed Justification for Air Traffic Organization (ATO)

Air Traffic Organization	FY 2010 Request: $7,302,739

Overview:

The Air Traffic Organization (ATO) is the global leader in delivering the world's safest, most secure air traffic services. As a Performance Based Organization (PBO), ATO measures its success in terms of safety, reliability, and cost effectiveness. ATO:

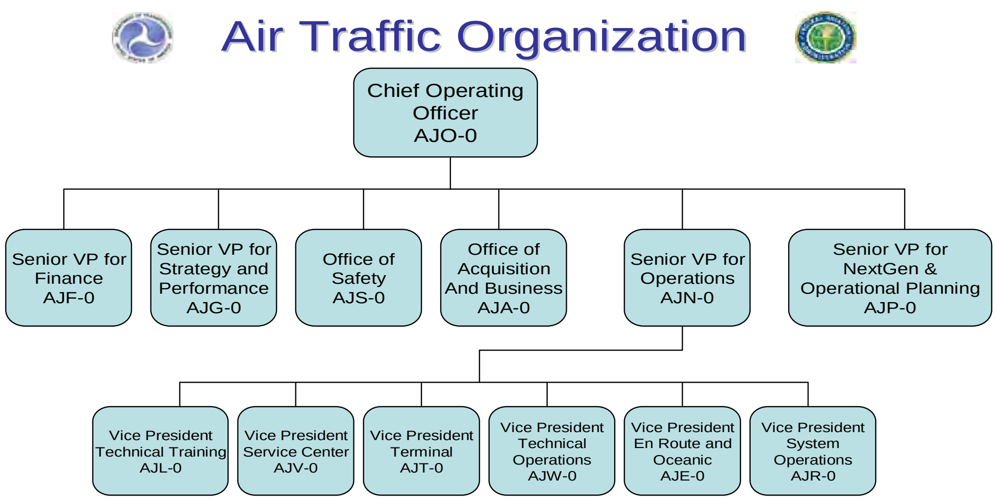
- Provides safe, secure, and cost-effective air traffic services.
- Creates a professional workplace for its employees in which they can excel and innovate an environment where all members of the ATO team embrace the organization's mission and vision with enthusiasm and pride.
- Accounts for its performance by measuring achievements against clear, specific goals.
- Effectively aligns its resources with programs that provide value to the flying public.

The FY 2010 Operations budget request reflects these values. Consistent with the Controller Workforce Plan (CWP), ATO plans to hire a net increase of 107 air traffic controllers to keep planes moving safely and efficiently throughout the country. This budget request supports the deployment of new equipment and programs and also funds much needed maintenance of existing systems in the National Airspace System (NAS). This request also covers anticipated increases in pay and inflation. Cost savings and avoidances are being sought throughout the system as well. Most notable of these in FY 2010 is the $16 million due to the reengineering of our service centers, as well as $32 million in other savings. In addition, the request reflects $5.4 million in base transfers to other FAA lines of business to continue to realign programs to the appropriate organizations.

In order to advance efficiency, safety, security, and customer service, new pieces of equipment are being installed and commissioned. This equipment is designed to improve overall operations, which will continue to streamline airline industry operations that are anticipated to increase—possibly tripling over the next 20 years—and enhance the experience for the air traveling public. Each of these systems will need to transition from the F&E budget to Operations program. Called NAS Plan Handoff (NPHO), these resources ($42.6 million in FY 2010) cover the day-to-day cost of operating and maintaining these new systems.

In 2003, FAA established the ATO. As the ATO evolves, changes in its structure are inevitable. As FY 2009 began, significant changes were made in order to take advantage of the operational character of several of the service units. Since tactical decisions were needed by Terminal, Technical Operations, En Route, and System Operations, they were all grouped below a single Senior Vice President of Operations (AJN) to facilitate the day-to-day nature of each organization. Additionally, two new service units were created – Service Centers and Technical Training. These were added to the other four service units to create a tactical organization that ensures the air traffic control mission is fully supported.

The leadership of this tactical structure, AJN, along with the service units for Finance, Strategy and Performance, Safety, Acquisition and Business, and NextGen and Operations Planning, make up the strategic leadership cadre for the ATO, with the Chief Operating Officer as the executive officer.



In December 2005, after 15 months of study, FAA announced its plans to simplify the ATO service area structure. The ATO consolidated its administrative and support staff functions wherever possible, reducing overhead and increasing productivity. The ATO consolidated administrative functions located in the nine service areas into shared service centers in just three regions. The three Service Centers (listed below) became operational in June 2006 and most of the affected personnel have already been transferred.

- The Eastern Service Area Office and Service Center is located at FAA regional office in Atlanta, Georgia.
- The Central Service Area Office and Service Center is located at FAA regional office in Fort Worth, Texas.
- The Western Service Area Office and Service Center is located at FAA regional office in Seattle, Washington.

The final phase of the service center consolidation effort, which began with the engineering services merger in 2008, will be completed by 2011. It includes realigning design engineering from the nine regional offices to the three previously-established service area offices.

This effort should accomplish the centralization of design processes and staffing synergy, with the goals of achieving cost savings, increasing productivity, and improving customer service without adversely impacting the core engineering service mission.

The ATO is grouping expertise in a simplified, shared-service structure. All branches of the organization will be able to access the knowledge and skills they need centrally. Shared services will reduce duplication of effort while increasing efficiency, productivity, and consistency in the support provided to field facilities.

As a result of this restructuring, FAA will provide higher quality, more consistent service to its customers while avoiding an estimated $360 to $460 million in costs over a 10- year period. Most of the savings will result from reductions in staffing requirements under a shared services environment and productivity gains realized by providing specialized skills and knowledge to different parts of the organization.

The FAA is working to reduce costs and improve performance by fundamentally changing the way it does business. The agency has slowed the growth of expenses by implementing several resource management initiatives, including a cost accounting system, and a pay-for-performance compensation structure. In 2005, FAA launched an agency-wide cost control program and ATO remains focused on:

- reducing overhead costs;
- investing in projects that will yield long-term savings;
- improving financial and project reporting; and
- holding managers accountable for controlling the cost of their programs.

To become better stewards of taxpayer funds, ATO:

1. Developed a budget execution tool to help managers plan and track the costs of their programs. This tool provides a complete financial picture, integrating costs, performance and personnel data at every level of the organization, from the service delivery point manager all the way up to the Chief Operating Officer. Managers can compare actual and planned costs and can adjust their programs in response to changes in program needs or resource availability quickly and effectively. This tool also allows managers to monitor key costs and performance indicators, marginal service production costs, direct versus indirect costs, activity volumes, and travel and training costs.
2. Developed financial and productivity metrics to measure performance and track the cost of operations. The ATO is now tracking and analyzing the service cost per flight paying particular attention to variations in per unit costs among the various service centers.
3. Spent the last few years training management in financial management best practices. The ATO also put standardization information on its web site that outlines the agency's standard financial management policies and procedures.
4. The ATO Capital Investment Team (CIT) continues to thoroughly evaluate the performance of capital programs. The members of this team apply a business case approach to each project as the program is assessed. Since April 2004, more than 182 projects have been reviewed. Five major projects (total of approximately $60 million) have been significantly restructured and segmented. Four projects were terminated. In FY 2008, 43 projects were reviewed for cost, schedule, performance, and benefits. Of these, three projects were significantly restructured and segmented to ensure delivery of capabilities in the most efficient time period.

One of the biggest success stories in cost management was the largest non-defense competitive sourcing initiative in the federal government — the contracting out of FAA's flight services function. That action will save the agency an estimated $2.1 billion in total savings and cost avoidance over a 13-year period.

In March 2009, FAA distributed an updated Interim Air Traffic Controller Workforce Plan entitled "A Plan for the Future." The final plan accompanying the budget contains detailed estimates of staffing requirements and highlights initiatives to improve the hiring and training program. The following table represents the controller workforce staffing for FYs 2007 – 2010.

	Actual On Board FY 2007	Actual On Board FY 2008	FY 2009 Projected Controller Workforce	FY 2010 Projected Controller Workforce
Air Traffic Controllers				
Fully-Qualified	11,988	11,517	11,892	12,238
En Route	5,233	5,056	5,095	5,077
Terminal	6,755	6,461	6,797	7,161
Developmental	2,886	3,864	3,693	3,454
En Route	1,559	1,738	1,779	1,948
Terminal	1,327	2,126	1,914	1,506
Total ATCT	**14,874**	**15,381**	**15,585**	**15,692**
Operations Supervisors				
En Route	808	821		
Terminal	980	1,033		
Total Operations Supv	**1,788**	**1,854**	**N/A**	**N/A**

(1) Actual distribution between Terminal and En Route may change based on actual attrition and operational needs.
(2) Air Traffic Controller numbers include all employees, FTP, PTP, LWOP, FTT and Trainees.
(3) Operations Supervisor numbers include all employees
(4) Fully-Qualified category includes Certified Professional Controllers In Training (CPCIT)
(5) Operations Supervisor numbers are not forecasted; therefore numbers for FY 2009 and FY 2010 are unavailable.

Significant accomplishments achieved in FY 2008 include:

- The FAA has made significant progress in refining controller staffing requirements and in effectively staffing facilities across the NAS by utilizing improved scheduling practices, new automated tools, and better management of leave. Air traffic controller workload and traffic volume are dynamic, so are staffing needs. Our goal is to base staffing on traffic, which takes into account changes in demand and fluid workload at individual facilities.

- Our controller workforce target for FY 2008 was 15,130. We ended the year exceeding the target with 15,381 controllers.

- Added state-by-state vacancy announcements to our national military recruitment effort to enable us to make better placement decisions.

- Attended recruitment fairs in both Seattle, Washington, and Ft. Rucker, Alabama, to reach military controllers preparing to leave their duty assignments.

- Added personnel in St. Louis, Missouri, to expedite security clearances; in Atlanta, Georgia, to expedite medical clearances; and in Oklahoma City, Oklahoma, to expedite the interview process. All of these efforts have helped reduce the clearance process timeframes greatly.

- The medical clearance process has been streamlined due to additional staff acting as liaison between the candidates and the agency. They conduct follow-up and tracking of medical clearance status. As a result, the timeframe has been reduced from about 6 months to 60-90 days.

- The interview process has been reduced from 6 weeks to about 2 weeks due to staff follow-up, tracking, and the implementation of electronic communication and tracking.

- In addition, we created a new approach to processing new hires through Pre-Employment Processing Centers (PEPC) which compress the overall hiring process to about 1 week. Applicants can be on-board as early as 4 weeks after completing the PEPC process. At least 10 PEPCs were conducted in FY 2008.

- Instituted a $20,000 Veterans Readjustment Appointment (VRA) recruitment bonus to encourage military controllers to continue as civilian employees.
- Added new vacancy announcements (reinstatement, Control Tower Operations certificate holders) to help refresh our applicant pools.
- Instituted payment of per diem for new hire trainees at the Academy with the expectation that it will reduce declinations.
- Increased Academy training to maximum capacity by adding classes and simulation resources for both tower and en route training.
- Terminal tower simulators in the field are reducing on-the-job training time and providing a more streamlined training process for developmental controllers. Four prototype systems were previously acquired and deployed in Chicago O'Hare, Miami, Ontario (CA), and Phoenix. Based on further analysis from the benefits from these four sites, the FAA has contracted to acquire additional simulators to be placed at the Academy and at various field sites around the country.
- In the 2007 staffing report, we presented authorized staffing ranges for each of FAA's 314 staffed facilities across the country, which gives us greater flexibility to match the number of controllers with traffic volume and workload. The ranges were developed by incorporating data points from industrial engineering staffing models, past productivity, peer productivity, and service unit input. These ranges are published in Appendix A of the report and will be updated annually.

FY 2009 Program:

The ATO provides essential services to the nation's aviation industry, which independent studies have estimated accounts for more than 11 million jobs and $1.2 trillion in annual economic activity—5.6 percent share of total U.S. economy, according to estimates published in the ***Economic Impact of Civil Aviation on the U.S .Economy, October 2008, by FAA's Air Traffic Organization***. More than 30,000 ATO employees support the operations that help move about 48,000 aircraft through U.S. airspace each day. Our employees are service professionals, providing the worlds' safest airspace and handling more than six times the traffic of the next largest air traffic control organization in the world. Air traffic controllers keep planes moving safely and efficiently while technicians, engineers, and support specialists maintain and repair critical equipment and facilities. Leaders at every level work to ensure that these services are provided in a cost-effective manner.

In FY 2009, FAA will hire new controllers for a net increase of 204. This hiring target is included in the March 2009 update to the Controller Workforce Plan, and will bring the total controller workforce up to 15,585 (from 15,381 at the end of FY 2008). ATO's hiring efforts will increase the total controller workforce to a level at which traffic at all facilities will be more than adequately covered.

Anticipated FY 2009 Accomplishments:

Operational Improvements:

- Expand the use of NextGen performance-based systems to one priority country.
- Ensure harmonization of service improvements through collaboration with international and industry service providers by active participation and leadership in regional ICAO and inter-organizational workgroups and decision-making processes.

- Promote strategic U.S. navigation technologies, including the Global Positioning System (GPS), with key civil aviation authorities and the global aviation community. Coordinate GPS and augmentation-related activities with key global partners in North America, the Caribbean Basin, South America, Europe and Asia Pacific.
- Promote strategic U.S. surveillance technologies, including Automatic Dependent Surveillance – Broadcast (ADS-B), with key civil aviation authorities and the global aviation community. Coordinate with the FAA Surveillance and Broadcast Services (SBS) Office to support key international efforts, including Asia Pacific and Caribbean and South American regional ADS-B Task Force meetings and multilateral ADS-B-provider coordination meetings.
- Commission five new runway/taxiway projects, increasing the annual service volume of the 35 Operational Evolution Partnership (OEP) airports by at least 1 percent annually (measured as a 5-year moving average).
- Achieve an average daily airport capacity for the seven major metropolitan areas of 39,484 arrivals and departures per day by FY 2009 and maintain through FY 2012.
- In 2009, the Chicago Airspace Project (CAP) will complete airspace design for Stage-3, in anticipation of O'Hare Modernization Project (OMP) Phase 1C. Stage-3 includes a second High and Wide arrival procedure from the west further increasing arrival capacity, and new west departure fixes and procedures that double the current capacity for Chicago O'Hare and Midway Airports. Complete design and modeling of sector realignments in Chicago Center to support the new arrival and departure procedures. Complete airspace reassignment design to expand approach control airspace to support new arrival procedures. Support Safety Risk Management (SRM) process for facilities. Support process to ensure environmental integrity is sustained.
- The implementation of the airspace improvements in the New York, New Jersey, and Philadelphia (NY/NJ/PHL) Metropolitan Areas have begun. Analysis on the sector changes for the J80 sectors have started. Two Human-In-The-Loop (HITL) simulations have been performed as part of the analysis, one for the En Route sector and one for the Terminal Sector. A combined HITL will be held in May of 2009 and will give us the implementation requirements that will allow the westgate departure expansion. The team will continue the analysis for the development of RNAV routes. The RNAV team has successfully simulated six PHL departures procedures this past February, to be further developed in 2009, for implementation in late 2010. Based on the analysis for the development of NY/NJ/PHL RNAV routes, propose improved routes.
- Complete airspace study for proposed Southern Nevada Supplement Airport including analysis, modeling, and simulation to quantify capacity, throughput and delay. Design routes and procedures supporting Las Vegas (LAS) near term enhancements, referred to as LAS Optimization. Evaluate and modify resulting airspace sector modifications. Begin Environmental Assessment for LAS Optimization, estimated to be completed in FY 2011.
- Emerging Western Metropolitan Areas – complete initial steps of problem identification and quantifying the impact of the existing airspace design for Dallas, Denver, and Southern California. Document the operational issues, specific objectives for airspace improvement, proposed solutions/changes, assumptions used to evaluate the change and the preliminary Safety Risk Management hazards identified.
- Expand FAA's existing OEP to incorporate critical NextGen operational concepts and changes and detailed milestones of key NAS modernization programs through 2025. Update Joint Planning and Development Office related avionics and policy decisions into the OEP Solution Set roadmaps.
- Deploy surveillance, air/ground communications and weather in the Gulf of Mexico in support of the Surveillance and Broadcast Services (SBS) National Program Office baseline. Complete installation of six air/ground communications sites in the Gulf of Mexico. Deploy weather in the Gulf of Mexico in support of the SBS National Program Office baseline. Complete an airspace plan for the Houston Center. Achieve Initial Operational Capability (IOC) for weather in the Gulf of Mexico in support of the SBS National Program Office.
- Continue deployment of Surveillance and Broadcast Services at key sites in the Eastern Service Area. Achieve In-Service Decision for Service Volume (SV) 168 Essential Services. Complete site acceptance testing at Louisville. Complete site acceptance testing at Philadelphia.

- Achieve an average daily airport capacity for the 35 OEP airports of 103,328 arrivals and departures per day.
- Develop and implement RNAV standard instrument departures (SIDs) and standard terminal arrival (STAR) procedures. Implement the performance-based navigation roadmap by continuing development and implementation of Area Navigation (RNAV) routes, SIDs, and STARs.

Safety:

- Provide safe and efficient terminal air traffic control services to meet target levels for Category A&B runway incursions and Category A&B operational errors. Achieve the annual safety performance targets for Category A&B runway incursions of no more than 0.472 incursions per million operations. Achieve the annual safety performance targets for Category A&B operational errors of no more than 2.10 per million operations.
- Establish and implement a voluntary safety report program for credentialed employees and technical employees of the ATO who actively operate, maintain and certify the systems and equipment of the National Airspace System. Drafted and presented a renewal agreement of the Air Traffic Safety Action Plan (ATSAP) Memorandum of Understanding (MOU) to the National Air Traffic Controllers Association (NATCA) bargaining unit for its consideration to enter into a continuing program agreement with the FAA (ATO and AOV) for voluntary safety reporting. NATCA representatives to the ATSAP program are currently in the process of reviewing the current agreement established between NATCA, ATO, and AOV in March 2009. The continuation letter for the current MOU is scheduled to be in place by September 2009. Conduct ATSAP initial training to air traffic control personnel by the end of the fourth quarter; implement ATSAP for at least 15 percent of all air traffic control specialists by the end of the fourth quarter of FY 2009. Draft and present an executed MOU to the FAA (ATO and AOV) and the Professional Aviation Safety Specialists (PASS) bargaining unit for its consideration to establish a voluntary safety reporting system for airway transportation system specialists by the end of the third quarter of FY 2009. Conduct ATSAP initial training to airway transportation system specialists by the end of the fourth quarter of FY 2009. Implement ATSAP for at least 15 percent of all airway transportation system specialists by the end of fourth quarter of FY 2009.
- By FY 2009, reduce accidents in Alaska for general aviation and all Part 135 operations from the 2000-2002 average of 130 accidents per year to no more than 99 accidents per year. This measure will be converted from a number to a rate after FY 2009.

Capacity:

- Provide power systems engineering, implementation, and operations expertise in support of major systems acquisitions and modifications in the NAS. Sustain operational availability at 99.70 percent for reportable power system facilities that support the 35 OEP airports.
- Provide overall life-cycle management of the functional and physical integrity of NAS unstaffed facilities and improve NAS building systems. Complete 4,600 facility condition index (FCI) assessments.
- Provide spectrum and engineering services and assign radio frequencies. Process 90 percent of all frequency requests within 90 calendar days from the original request.
- Analyze Extended Service Volumes (ESV) requests in support of area navigation RNAV/RNP requirements. Complete 100 percent of all ESV requests in support of RNAV/RNP requirements.
- Improve aviation fuel efficiency by another 1 percent over the FY 2007 level (for a total of 6 percent) through FY 2008, and 1 percent each subsequent year through FY 2012 to 10 percent, as measured by a 3-year moving average of the fuel burned per revenue mile flown, from the 3-year average for calendar years 2000-2002.
- Sustain adjusted operational availability of 99.70 percent for the reportable facilities that support the 35 OEP airports through FY 2012.

Organizational Excellence:

- Organizations throughout the agency will continue to implement cost efficiency initiatives such as: 10-15 percent savings for strategic sourcing for selected products and services.
- By the end of FY 2009, reduce leased space for Automated Flight Service Stations from approximately 510,000 square feet to approximately 150,000 square feet.
- Achieve a 3 percent reduction in help desk operating costs through consolidations and annual reduction of $15 million in Information Technology operating costs.

FY 2010 Budget Request:

The Chief Operating Officer for the Air Traffic Organization requests $7,302,739,000 and 32,079 FTEs in Operations to meet its mission in FY 2010. This is an increase of $204,417,000 (2.9 percent) above the FY 2009 enacted amount. The FY 2010 budget requests this funding increase to hire a net increase of 107 new controllers, a level consistent with the targets being developed for the updated staffing plan, *A Plan for the Future: The FAA's 10-Year Strategy for the Air Traffic Control Workforce,* that was published in March 2009.

Specific goals for FY 2010 include:

Operational Improvements:

- Manage the international strategy in support of the NextGen Global Harmonization Working Group and work with civil aviation and interagency partners to continually assess and implement the strategy.
- Manage the implementation of the NextGen international activity by undertaking international collaborative activities with United States Government stakeholders and key countries in technologies or procedures of mutual interest. Identify existing mechanisms to expand international NextGen cooperation with additional countries and international organizations. Manage, with support from the Joint Planning and Development Office (JPDO) and respective ATO service units, the cooperative projects and initiatives identified in the established NextGen System Steering Groups with Japan, China, Canada, and Mexico.

Safety:

- Develop a proof of concept that leads to a prototype ground-movement safety infrastructure to provide direct warning capability to pilots, drivers, and controllers. Continue to conduct an integrated assessment of emergent runway safety technologies and conduct simulation analyses to assess effectiveness, interoperability, and level of readiness for operational transition to a National Airspace System (NAS) ground movement safety infrastructure. Operational solutions for approach warning in the Direct Warning System Study will be evaluated at an airport that has an existing Runway Status Warning System. Conduct field evaluations of an initial flight deck direct warning capability. Test initial algorithms in test avionics with industry participants.
- Achieve the annual safety performance targets for Category A&B operational errors of no more than 2.05 per million activities.
- Achieve the annual efficiency performance target for NAS On-Time Arrivals of not less than 88.00 percent.
- Improve flight hours per direct employee from FY 2009 levels. FY 2010 target: 3,696 annualized forecasted flight hours per ATO-E direct employee.
- Maintain service availability to achieve a National Airspace System (NAS) on-time arrival rate of 88.00 percent at the 35 OEP airports.
- Identify risk concerns through audits, evaluations, and investigations. Brief and provide recommendations to senior management. Review a minimum of 12 preliminary pilot deviations

and other air traffic incident reports each month to validate the accuracy of initial classifications. Conduct on-site investigations of accidents and incidents. Identify good operating practices to avoid recurrences of risks identified through evaluations and investigations processes. Disseminate findings and provide recommendations for corrective actions to appropriate service units.

- By FY 2010, limit Category A and B (most serious) runway incursions to a rate of no more than 0.450 per million operations, and maintain or improve through FY 2013.
- Publish minimums to runways in Alaska. Develop 10 area navigation (RNAV) (GPS) instrument approach procedures with lateral precision with vertical guidance/ lateral precision/lateral navigation (LPV/LP/LNAV) minimums to runways in Alaska. Completion of this activity is contingent upon at least 10 qualifying runway/obstacle surveys being approved and delivered to the National Flight Procedures Office no later than September 30, 2009. These surveys must be at airports located within existing WAAS coverage.

Capacity:

- Sustain operational availability at 99.70 percent for reportable power system facilities that support the 35 OEP Airports.
- Deliver NextGen/OEP commitments by achieving the percentage of AJE National Airspace System (NAS) critical NextGen Architecture Transition Decision milestones as planned.
- Increase percentage of oceanic airspace using reduced separation standards from the FY 2004 baseline. Improve global interoperability in the oceanic and off shore domains via collaboration with strategic partners and support longer-term Joint Planning & Development Office/Next Generation Air Traffic System initiatives. Develop operational and software requirements for operational prototyping of pre-departure Oceanic Trajectory Management 4D (OTM4D).
- Improve aviation fuel efficiency by another 1 percent over the FY 2007 level (for a total of 6 percent) through FY 2008, and 1 percent each subsequent year through FY 2012 to 10 percent, as measured by a 3-year moving average of the fuel burned per revenue mile flown, from the 3-year average for calendar years 2000-2002.
- Implement high altitude airspace redesign to reduce congestion. Complete analysis of proposed redesign projects and implement selected portions of key projects.
- Sustain adjusted operational availability of 99.70 percent for the reportable facilities that support the 35 OEP airports through FY 2012.
- Chicago Airspace Project: realign airspace and implement new departure routes and new high and wide procedures to support new center OMP runway with triple parallel approaches.
- Implement airspace improvements in New York, New Jersey, and Philadelphia (NY/NJ/PHL) areas. Stage II of the NY/NJ/PHL implementation will support Westgate departure changes; possible area of study is N90. We also will try to implement a third westbound PHL departure. Complete analyses for Stage II of the NY/NJ/PHL implementation will support Westgate departure changes.
- Achieve an average daily airport capacity for the seven major metropolitan areas of 39,484 arrivals and departures per day by FY 2009, and maintain through FY 2012.
- Implement the roadmap for performance-based navigation by the continued development and implementation of Area Navigation (RNAV) routes, standard instrument departures (SIDs), and standard terminal arrivals (STARs). Prepare procedure development, flight check, and publication of 50 RNAV SIDs/STARS.
- Redesign airspace to support new runways at OEP airports. Implement arrival and departure flows to support new runway at Seattle (SEA). The related airspace changes will support the new runway.
- Redesign airspace at OEP airports without new runways. The Airspace Management Program will use High Altitude Airspace Management Program to complete transfer of en route airspace to Potomac TRACON to better manage arrivals into Washington Dulles International Airport (IAD) in support of new runway.

Organizational Excellence:

- Acquire and develop necessary skills by achieving the target for months to certification of developmentals from Stage I to IV (not including the Certified Professional Controllers (CPC) in-training (IT)).
- Reduce OJT for certification of developmentals from Stage I to IV (not including CPCs IT). Ensure that 90 percent of new controllers meet or come in under their budgeted time for certification.
- Coordinate and report on the initiative efforts to maintain the ATC Workforce Plan annual hiring within 2 percent of the ATC Workforce Plan hiring targets. Report progress on meeting ATC actual-on-board (AOB) monthly targets as indicated in the Federal Personnel Payroll System (FPPS).
- Update the Air Traffic Control (ATC) Workforce Report to Congress.
- Continue to provide FAA controller staffing requirements as outlined in the FAA interim hiring plan titled, "A Plan for the Future: The FAA's 10-Year Strategy for the Air Traffic Control Workforce," which was provided to Congress in March 2009. Hire 1,702 new controllers.
- Complete FTI deployment of sites and services. Operate and maintain telecommunications for FAA users consistent with expected performance levels.
- Ensure a safe and healthful workplace for all ATO employees. Achieve full compliance with safety and environmental compliance requirements based on EPA/OSHA regulations. Receive zero (0) OSHA findings designated as "willful violations."
- Reduce unit cost of ATO-E operations by managing indirect labor costs at service delivery points (SDP) within plus or minus 5 percent variance of the established cost target.
- Implement the hiring, training, staffing analysis, and management recommendations of the Air Traffic Controller Workforce Plan to support FAA's safety mission and meet external stakeholder requirements. Update and report annually on agency progress.
- Obtain an unqualified opinion on the agency's financial statements (Clean Audit with no material weaknesses).

<u>NAS Plan Handoff Requirements</u>

NAS Plan Handoff (NPHO) funding requirements are driven by operations and maintenance (O&M) bills for new acquisition systems commissioned in FY 2008. While the Facilities & Equipment (F&E) appropriation will be paying these bills through FY 2009, agency policy dictates that they be subsequently transitioned to the Operations appropriation in FY 2010. These costs include recurring telecommunications installations and upgrade expenses, contractor support for preventative maintenance, funding to buy parts and pay for repairs, software maintenance updates and fixes, infrastructure repairs, field maintenance support, and training. The ATO is requesting $42.6 million for NAS Plan Handoff costs in FY 2010.

The NAS continues to grow in size and complexity as new systems are procured and fielded. In 1998, the NAS had 38,209 manned and unmanned operational facilities, and, as of October 1, 2008, there were 59,833 facilities, an increase of 21,624 and an average of an additional 2,162 pieces of equipment per year. The NAS Operational Inventory Report was re-written in October 2007. It now uses WebFSEP as the national source for the report. The new version of the report now includes all of the disciplines, i.e., Automation, Communication, Navigation, Surveillance, Weather, Infrastructure, and Mission Support. Previously, the report did not include Infrastructure and Mission Support equipment.

The NPHO request is a direct result of capital acquisition programs fielding systems in the F&E appropriation and varies each year depending on the number of systems being deployed. The Operations appropriation is required to fund the additional recurring O&M expenses for newly-commissioned NAS systems.

Although most replacement systems are more efficient and reduce O&M costs by replacing older systems, this is not always the case. Some replacement systems are more expensive than the systems being replaced and require additional funding to maintain. For example, when a consolidated TRACON facility is built, the towers co-located with the TRACONs being consolidated do not actually shut down, but stay open and continue to have an operational requirement for utilities, grounds maintenance, custodial, guard services, and general maintenance. Therefore, the Operations funding for these facilities cannot be transferred to the new consolidated TRACON, so additional resources are frequently required to pay the recurring bills to support the new TRACON. In addition, a new or replacement system often provides additional features making both the hardware and software more complex, and thus more difficult and expensive to maintain.

An example of this is Airport Surface Detection Equipment - Model X (ASDE-X). The ASDE-X system is designed to aid in the prevention of accidents resulting from runway incursions. ASDE-X is capable of processing three types of sensor data providing a robust surveillance picture consisting of three dimensional target locations, target identification, and universal time. The three sensor types of ASDE-X are independent (primary surface radar), cooperative (multilateration and secondary surveillance radar), and dependent (ADS-B) surveillance sources. ASDE-X improves surface safety; provides surface situational awareness and positive identification of targets on the surface, including conflict detection and alerting; benefits ATC by providing a collaborative decision-making tool based on improved situational awareness; provides enhancements to increase the capabilities provided by the current ASDE-3/AMASS system; and improves the accuracy and timeliness of surveillance data. ASDE-X will reduce the risk of runway collisions, resulting in avoided fatalities, injuries, and aircraft damage and reduced taxi delays, resulting in aircraft direct operating cost savings and passenger savings.

The FAA Standard Work Breakdown Structure (WBS) is used to identify O&M costs associated with both new and replacement systems. Below is a brief description of each WBS element:

- Preventive Maintenance/Certification – All activities associated with preventive maintenance of hardware and software, including activities specific for certification.
- Corrective Maintenance – All activities associated with corrective maintenance of hardware and software. This also includes activities related to packaging and shipping components to depot level repair facilities.
- Modifications – All activities associated with implementation of modifications to in-service hardware and software.
- Maintenance Control – All activities associated with providing oversight and coordination in operating and maintaining the NAS infrastructure, including NAS Operation Managers.
- Technical Teaming – All activities associated with the investigation and resolution of general technical issues relating to system performance.
- Watch Standing Coverage – Watch standing coverage beyond stated staffing requirements.
- Program Support – All administrative activities associated with planning, organizing, managing, and directing actions required in support of operating and maintaining the solution.
- Logistics – All activities associated with depot level support to NAS prime mission equipment and associated support equipment.
- In-Service Training – All activities associated with on-the-job training and refresher training of personnel who directly operate, maintain, or provide support functions of the solution. This includes contractor provided costs associated with specific training. Training costs include course conduct (including instructor and facilities costs), travel, and per diem costs for students.
- Second-Level Engineering – All engineering activities in support of the delivery of service, to include development of modifications, documentation, testing, and configuration management. It includes the evaluation, prototype, testing, and implementation of technology refresh initiatives, as well as contractor staffing and travel as applicable.

- Infrastructure Support – All activities associated with maintenance, operations, and security of leased and owned buildings, structures, grounds, roads, and support vehicles for operational systems or people who support or operate those systems. Also includes physical security personnel.
- Flight Inspections and Standard Instrument Approach Procedures Development – All activities associated with the development, NAS integration, and maintenance of standard instrument flight procedures, flight inspection procedures, and the compilation, replication, and dissemination of charts and related paper and digital products.
- System Performance Assessment – All activities associated with assessing equipment and system performance and trends, including metrics development, data collection, and trend analysis.
- System Operations – All non-maintenance activities associated with directly operating or monitoring the solution. This includes computer operations, system administration, system security administrators, information security assessments, audits, etc.
- Travel to and from sites – Travel time to and from sites to perform any type of In-Service Management work.

<u>Cost Savings Initiatives</u>

In FY 2010, ATO will realize a total of $48 million in new cost savings. These savings are derived from the following initiatives:

- Service Center - $16.0 million – ATO Service Center (AJV) organization has effectively lowered its costs through continuing to consolidate both staff and facilities. Business process reengineering efforts at the Service Centers has continued to increase efficiency.
- Rents, Utilities, Leases - $8.7 million – ATO Technical Operations (AJW) organization is the resident organization for Engineering Services, the last of the groups being consolidated through the service center consolidation effort. As staff relinquishes facility space, rents, utilities, and leases decrease.
- Administrative Overhead Efficiencies - $23.3 million – ATO is confident that we can continue recent efforts to streamline administrative operations and achieve a considerable reduction. This reduction is being contributed through many of the programs, staffing efficiencies, and utilization of contracts such as Strategic Sourcing for the Acquisition of Various Equipment and Supplies (SAVES). We continue to consolidate the overhead function in headquarters and are pursuing savings in the procurement of supplies and equipment for additional savings.

<u>Strategic Management Plan</u>

The ATO is unveiling a new strategic management process called <u>ATO Strategy 2013</u>. It takes the lessons learned from the Strategic Management Plan (SMP) and builds an even more finely-tuned metrics process that helps the ATO shape its future. As always, safety is the number one concern of this new program, but, there is recognition that technology and innovation should be significant parts of the equation when striving to enhance the air transportation experience. In addition to the need to fly safely by emphasizing an increase in system safety, metrics will also ensure that capacity, flexibility, predictability, and efficiency are also monitored closely. Agency goals have been established that ensure the measurement of progress each month provides a complete picture of the ATO's progress. Significant amounts of the efforts are being crafted to support the implementation of the NextGen programs—deploy transformational NextGen technology, advance and accelerate the evolution to NextGen with new technology, and ensure acquisition activities are aligned with the budget.

These metrics compel ATO to focus on managing the cost of delivering services rather than on managing budgets. Metrics such as overtime use have multiple benefits—less leave abuse, more employees available for work, easier shift management, and, in the long run, an overall reduction in labor costs.

Improved labor distribution reporting also has several benefits. Labor costs are more accurately tied to the cost of providing services, and with better labor data, managers can make more informed decisions on how and where to allocate staffing.

Budget Request by Service Unit and Staff Office

At the beginning of FY 2009, ATO realigned into four business units: Operations, NextGen and Operations Planning, Finance, and Strategy and Performance. Within the Operations Business Unit, there are four major operational service units: En Route and Oceanic Services, System Operations Services, Technical Operations Services, and Terminal Services. Several other service units support the ATO: Office of Acquisition and Business, Office of Safety, Office of Service Centers, and Office of Technical Training.

Service Unit	FY 2010 Estimate	End of Year	FTE
Senior Vice President Operations	**$6,773,622**	**30,337**	**31,172**
Vice President En Route & Oceanic	$1,753,201	8,931	8,821
Vice President Terminal	$2,082,869	10,669	11,241
Vice President Technical Operations	$2,061,296	8,400	8,745
Vice President System Operations	$580,808	1,312	1,291
Vice President Service Center	$118,485	646	688
Vice President Technical Training	$176,963	379	386
Other ATO Staff Offices*	**$529,117**	**885**	**907**
TOTAL	**$7,302,739**	**31,222**	**32,079**

*Other ATO Staff Offices include: Acquisition and Business, Finance, Strategy and Performance, Safety, and NextGen and Operations Planning

Resource Summary - Air Traffic Organization (ATO)

	FY 2008 Actual	FY 2009 Estimate	Unavoidable Changes	Discretionary Changes	FY 2010 Request
Funding ($000):					
PC&B	4,749,469	5,019,388	204,137	9,404	5,232,929
Other Objects					
Travel/Transportation	110,524	110,523	552	0	111,075
Other Services	1,562,358	1,435,571	38,734	-31,907	1,442,398
Rent/Communications/Utilities	351,372	346,191	1,697	-15,700	332,188
Other	191,650	186,649	929	-3,429 0	184,149
Subtotal	2,215,904	2,078,934	41,912	-51,036	2,069,810
Total	6,965,373	7,098,322	246,049	-41,632	7,302,739
Staffing					
Senior Vice President Operations	**29,885**	**30,143**	**0**	**194**	**30,337**
Vice President En Route & Oceanic	8,500	8,760	0	171	8,931
Vice President Terminal	10,647	10,693	0	-24	10,669
Vice President Technical Operations	8,429	8,380	0	20	8,400
Vice President System Operations	1,285	1,285	0	27	1,312
Vice President Service Center	646	646	0	0	646
Vice President Technical Training	378	379	0	0	379
Other ATO Staff Offices*	**898**	**893**	**0**	**-8**	**885**
Total	**30,783**	**31,036**	**0**	**186**	**31,222**
FTE's					
Senior Vice President Operations	**30,713**	**30,946**	**153**	**73**	**31,172**
Vice President En Route & Oceanic	8,530	8,627	119	75	8,821
Vice President Terminal	11,045	11,229	34	-22	11,241
Vice President Technical Operations	8,787	8,739	0	6	8,745
Vice President System Operations	1,277	1,277	0	14	1,291
Vice President Service Center	688	688	0	0	688
Vice President Technical Training	386	386	0	0	386
Other ATO Staff Offices*	**901**	**896**	**0**	**11**	**907**
Total	**31,614**	**31,842**	**153**	**84**	**32,079**

*Other ATO Staff Offices include: Acquisition and Business, Finance, Strategy and Performance, Safety, and NextGen and Operations Planning

Senior Vice President Operations (AJN-0)

With safety clearly the most important aspect of air traffic, the ATO was realigned to ensure that each tactical organization is grouped together in a single operations unit. Day-to-day organizational synergy makes certain that knowledge is shared across all of the six groups included in the operations effort. The service units included are En Route, Terminal, Technical Operations, System Operations, Technical Training, and Service Centers. This unit is led by a senior vice president, one of a few direct reports to the ATO's Chief Operating Officer.

Vice President En Route and Oceanic (AJE-0)

En Route and Oceanic Services (AJE-0) provides air traffic control operations, systems and facilities necessary to operate, maintain, and improve the U.S. National Airspace System. From 23 service delivery points in the U.S., Puerto Rico, and Guam, AJE controls more than 29 million square miles of airspace over the continental United States and the Atlantic and Pacific Oceans. Every day AJE ensures that thousands of positively controlled aircraft at high altitudes en route from one terminal area to another are directed on the safest, most efficient path to their destinations. Customers include domestic and international airlines, general aviation, the Department of Defense, and the Department of Homeland Security.

AJE's almost 12,000 pieces of equipment help maintain air traffic control operations utilizing complex voice and data switching equipment, radio and microwave transmission systems, local and remotely-located radio, and radar systems. Headquarters and Technical Center employees are responsible for acquisition program management, engineering, production, logistics, testing, training, and systems and procedures implementation. Since the mid-1990s, AJE has fielded modern communications, display, and weather systems for controller use. Major acquisition programs such as En Route Automation Modernization (ERAM) and Broadcast and Surveillance Services (ADS-B) are replacing yesterday's equipment with flexible, resilient, scalable, and adaptive systems that will provide the platform for the next generation air transport system (NextGen). In addition, new en route separation standards, navigation procedures, and innovative routing are reducing flight time and saving fuel. AJE's efforts are saving fuel, and reducing airspace congestion. AJE is saving money for air carriers and general aviation, reducing delays for passengers, and cutting airplane emissions.

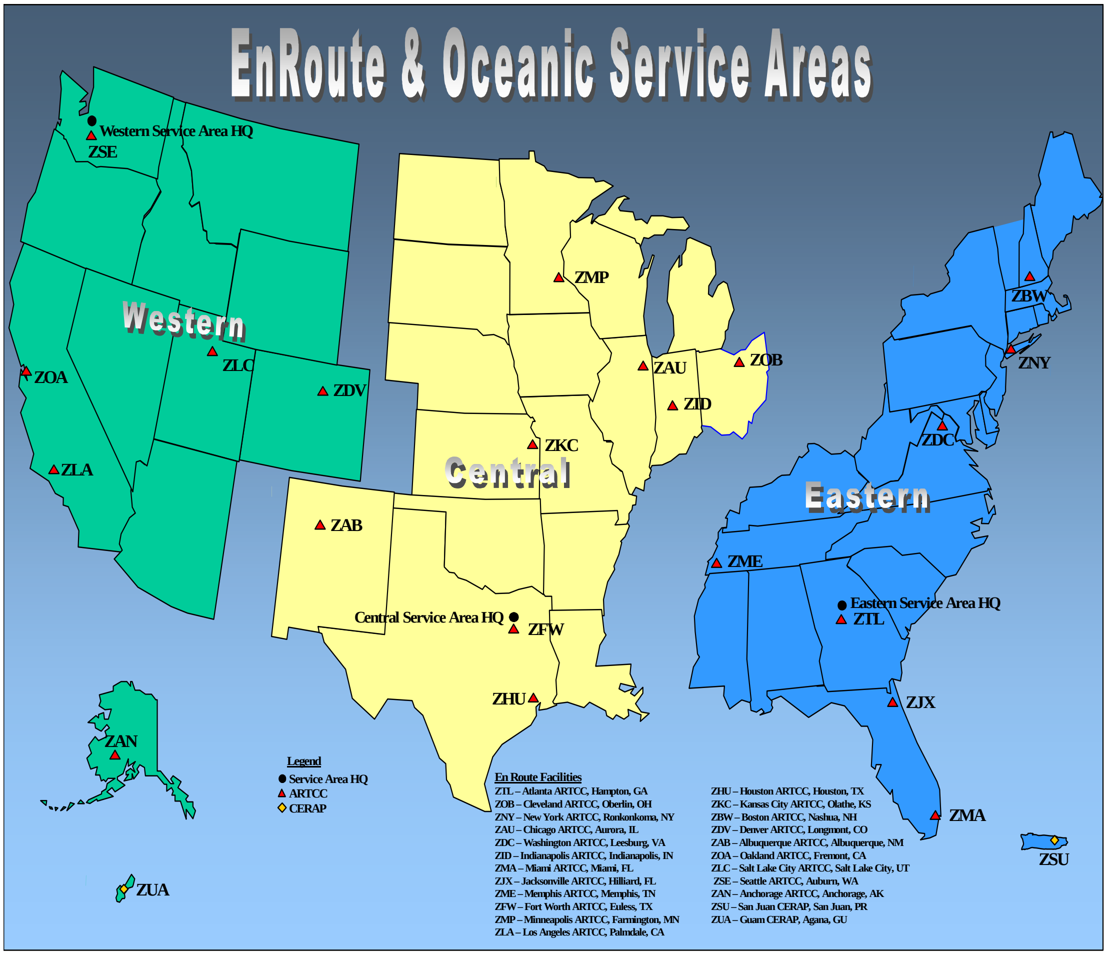
Through innovative training techniques and efficient database tracking, AJE is also ensuring that a consistent progression of air traffic controllers is available to staff its facilities now and in the future. AJE has deployed high fidelity simulation systems to provide realistic training that reduces the time it takes a student to reach professional controller status.

Vice President En Route and Oceanic, AJE-0

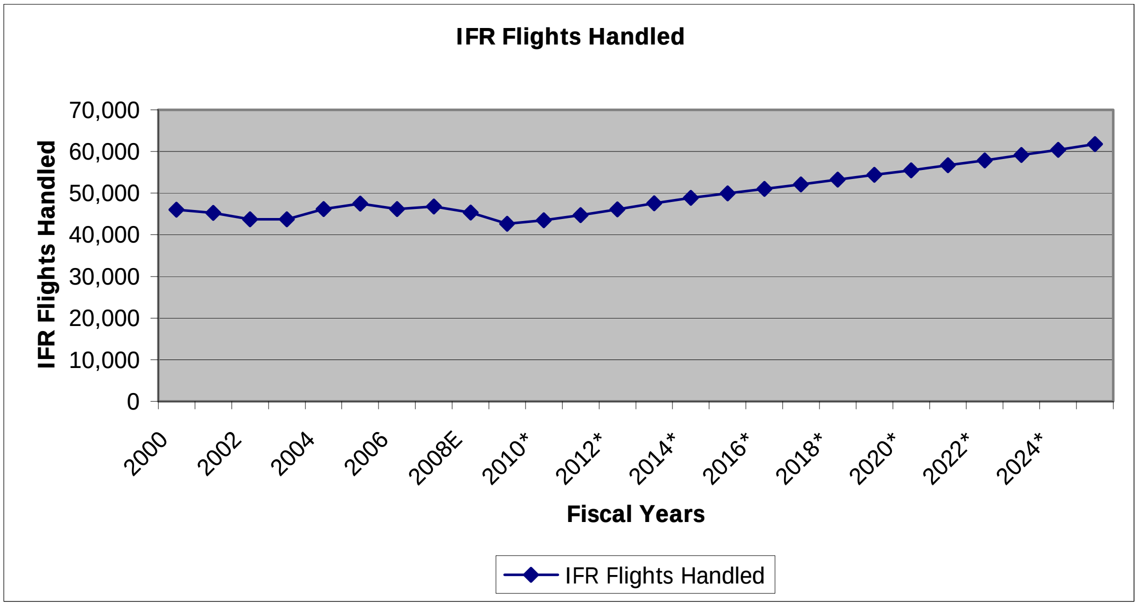
	FY 2008 Actual	FY 2009 Estimate	Unavoidable Changes	Discretionary Changes	FY 2010 Request
Funding ($000)					
PC&B	1,527,119	1,534,308	71,195	8,020	1,613,523
Other Objects					
Travel/Transportation	3,783	3,682	20	0	3,702
Other Services	147,776	119,215	9,784	0	128,999
Rent/Communications/Utilities	1,852	1,803	10	0	1,813
Other	5,279	5,137	27	0	5,164
Subtotal	158,690	129,837	9,841	0	139,678
Total	1,685,809	1,664,145	81,036	8,020	1,753,201
Staffing					
End-of-Year	8,500	8,760	0	171	8,931
Full-time Equivalent Employment	8,530	8,627	119	75	8,821

The En Route and Oceanic Service Unit requests an additional $89.1million, which includes funding for an additional 151 controllers ($6.4 million) and 24 NextGen staff ($1.6 million). Staff salary increases include all basic pay raises ($71.2 million). NAS Plan Handoff is $9.2 million, and non-pay inflation is an additional $0.6 million.

Below is a map of ATO's En Route and Oceanic Service Areas and the locations of the En Route centers.



The chart below depicts the number of Instrument Flight Rules (IFR) flights handled and IFR flight hours. The number of IFR flights handled is calculated by multiplying the number of IFR departures (an en route IFR flight which originates in the center's area and enters that center's airspace) by two, then adding the number of en route IFR flyovers (an IFR flight that originates outside the center's area and passes through the area without landing).



En Route and Oceanic has a NPHO requirement of $9,189,000. This covers the following program:

F06.01-00 En Route Facility Sustain – In FY 2010, the FAA will incur costs in the Operations account for operations and maintenance expenses for air route traffic control center (ARTCC) and oceanic en route approach (CERAP) facilities in the amount of $9,189,000. This includes infrastructure support activities associated with maintenance and operation of buildings, structures, plants equipment, grounds, and roads for the 21 ARTCCs and 2 CERAPs. Planned activities include: repairing and painting of building exterior and interior walls, structures and equipment mounts and shelters; repair/replacement of plumbing, faucets, toilets, and sinks; repair/maintenance of heating, ventilation, and air conditioning system/equipment; replacement of window air conditioners; and repair/replacement of furnishings and fixtures such as shades, cabinets.

Vice President Terminal (AJT-0)

The Terminal Service Unit provides terminal air traffic control (ATC) services. It provides ATC services daily, develops ATC capabilities, monitors operational performance, manages programs in support of these services, and serves as a liaison to customers, airports, and service area operations personnel.

Terminal ATC services include both airport surface operations and terminal area operations. Airport surface operations are conducted by controllers at 505 federal and contract towers located at the nation's busiest airports. Aircraft and many other vehicles share the airport surfaces, creating a challenging environment at these airports. Terminal area operations are conducted by controllers at 164 terminal radar approach control (TRACON) facilities, which routinely handle aircraft within 40 or more miles of an airport. In many cases these facilities are combined with operations personnel shared between the facilities.

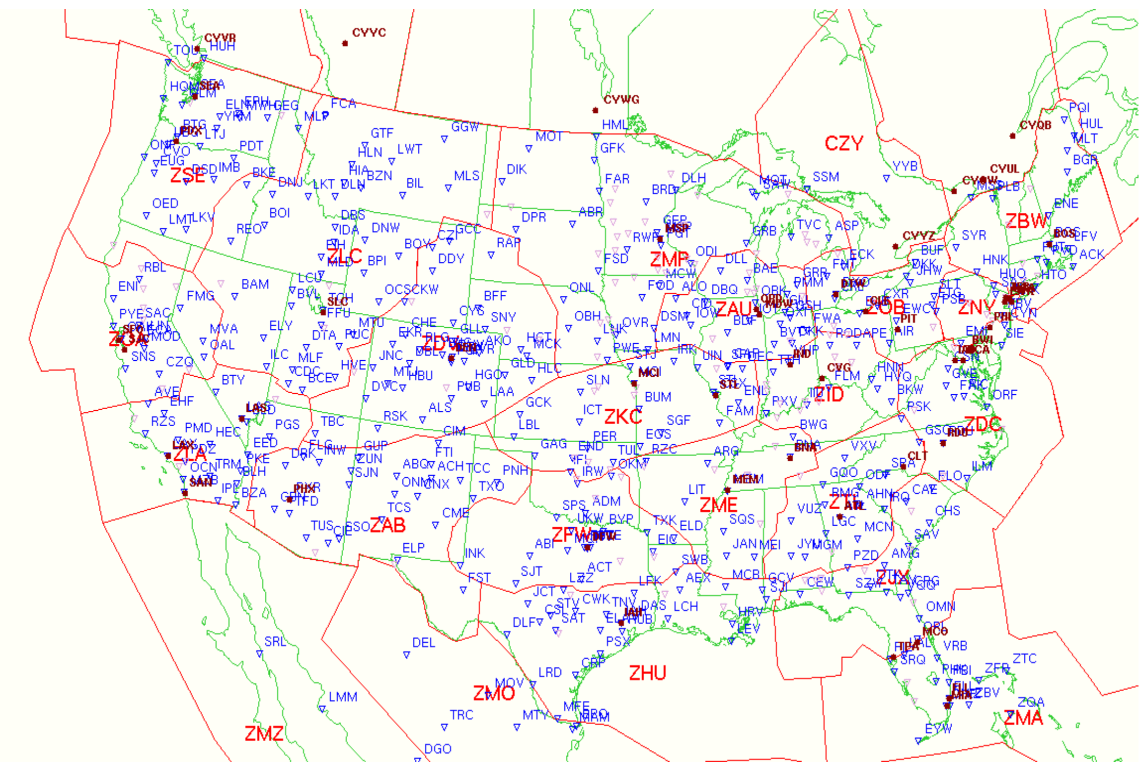
The Terminal Service Unit is divided into three geographical service areas (Eastern, Central, and Western) to better manage the delivery of terminal ATC services. The primary function of each service area is to oversee ATC operations within its geographical area, and to ensure that quality standards established for safety, capacity, and organizational excellence are met.

Vice President Terminal, AJT-0

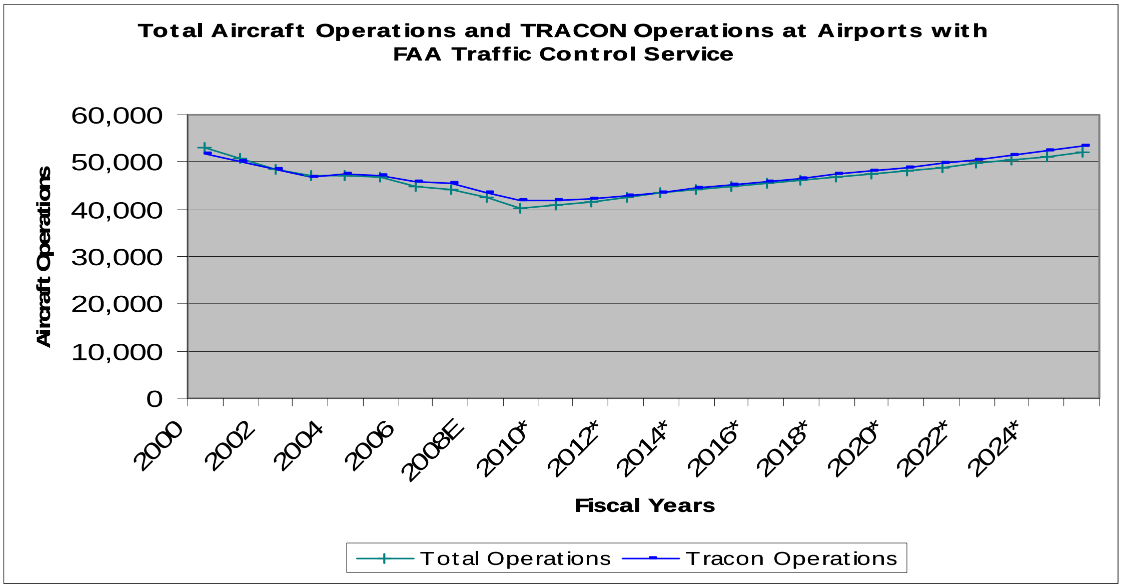
	FY 2008 Actual	FY 2009 Estimate	Unavoidable Changes	Discretionary Changes	FY 2010 Request
Funding ($000)					
PC&B	1,662,060	1,758,401	68,104	-928	1,825,577
Other Objects					
Travel/Transportation	8,217	8,468	41	0	8,509
Other Services	200,461	201,660	32,141	0	233,801
Rent/Communications/Utilities	1,269	1,308	6	0	1,314
Other	13,270	13,603	65	0	13,668
Subtotal	223,217	225,039	32,253	0	257,292
Total	1,885,277	1,983,440	100,357	-928	2,082,869
Staffing					
End-of-Year	10,647	10,693	0	-24	10,669
Full-time Equivalent Employment	11,045	11,229	34	-22	11,241

The Terminal Service Unit requests an additional $99.4 million, which includes a gain of 14 NextGen staff ($1.0 million). Staff salary increases include all basic pay raises ($67.2 million). NAS Plan Handoff is $23.2 million, and non-pay inflation is an additional $1.0 million. Also requested is a total of $8.1 million for Department of Labor wage adjustments for the Contract Tower and Contract Weather Programs.

The map below shows the airports where FAA provides terminal services.



The chart below shows the total aircraft operations and instrument operations at airports with FAA traffic control services.



Terminal has a NPHO requirement of $23,191,477. This covers the following programs:

A03.04-00 Terminal Automation Sustain – The Common Automation Radar Terminal System (CARTS) is one of two terminal air traffic control automation systems. There are over 100 CARTS systems fielded NAS-wide. Facilities operating with CARTS systems include five of the largest TRACONs that support 17 of the 35 OEP airports. These costs include hardware logistical support, software maintenance support, and system field support. Sustainment and operation of the CARTS systems are critical to NAS terminal operations.

Beginning in FY 2010, FAA will incur costs in the Operations program for a recurring operations and maintenance bill in the amount of $6,085,000. This funding for second-level engineering support for all operational and support systems, maintenance of technical manuals, maintenance of system security policies and procedures, software licenses and operation of field support sites.

These recurring costs are for support of 11 CARTS IIIE systems, 99 CARTS IIE systems, and all associated support sites. If the funding is not provided, the program will be unable to maintain the operation, security and safety of CARTS automation systems. Lacking adequate funds to maintain these systems will result in increase risk to safety and service, operational outages, and delays in airport arrivals and departures.

F01.01-00 Terminal Facility Sustain – Beginning in FY 2010, FAA will incur costs in the Operations program for recurring operations and maintenance in the amount of $9,790,532. This includes infrastructure support activities associated with maintenance, operation, and security of leased and owned buildings, structures, grounds, and roads for operational systems. Planned activities include: repairing and painting of building exterior and interior walls, structures and equipment mounts and shelters; repair/replacement of plumbing, faucets, toilets, and sinks; repair/maintenance of heating, ventilation, and air conditioning system/equipment; replacement of window air conditioners; and repair/replacement of furnishings and fixtures such as shades, cabinets, and consoles.

M20.01-00 Training Simulator - Beginning in FY 2010, FAA will incur costs in the Operations program for recurring operations and maintenance in the amount of $2,150,000:

- $1,020,290 for Program Support – This includes all activities associated with field-support resources, prime contractor system performance and maintenance, logistics support, and technical refresh management.

- $677,785 for Training – This includes all costs associated with the student and instructor travel to the facility housing the simulator system. This also includes the instructors' salary associated with training the students on the simulator.

- $181,184 for Infrastructure Support – This includes the cost for additional power required for each facility (18 hubs and 4 prototype sites).

- $162,056 for Corrective Maintenance – This includes all costs associated with maintaining the physical facility housing the simulator. The facilities include the 18 hub sites, the 4 prototype system sites as well as the FAA Academy.

- $108,685 for Commercial Depot Logistics (CDLS) Contracts – This includes on-call support and depot sparing. The funding applies to all the facilities hosting the simulation system.

These recurring costs are to support the 18 hub sites, the 4 prototype sites and the FAA Academy. The FAA Academy conducts technical training for air traffic controllers, airway facilities technicians, aviation safety inspectors, and other specialists, and is responsible for internal training infrastructure. Training on the new systems being installed (resulting from NAS modernization) requires updated simulators, training media, and communications equipment. This program updates the simulators, training media, and communications equipment that significantly cuts training costs and creates a well-trained technical workforce.

The NAS Training Simulator project acquired and deployed training simulators to selected air traffic facilities in the field as well as the FAA Academy. This project focuses on using technology to assist FAA in training newly-hired controllers during the next 10 years in response to projected staffing requirements.

If funding is not provided, the commissioned hubs, prototypes, and the FAA Academy systems will not be supported, including site scenario generation and site adaptation. The agency developed a plan to hire, staff, and train controllers. This report, *A Plan for the Future: The FAA's 10-years Strategy for the Air Traffic Control Workforce*, calls for greater efficiency in training procedures. One goal of this plan, which calls for reducing training costs by 33 percent, will not be met without this funding.

S03.02-01 Terminal Radar Program (ASR-11) – Beginning in FY 2010, FAA will incur costs in the Operations program for recurring operations and maintenance in the amount of $324,000:

- $85,000 for Program Planning, Authorization, Management and Control – All activities associated with planning, authorizing, and managing all actions that must be accomplished for operation and maintenance of the solution, including preparing project-specific input to agency-level planning documents, such as the call for estimates and NAS architecture. It also includes activities associated with security control, as well as activities required to ensure that all cost, schedule, operational performance, and benefit objectives are met.

- $58,000 for Second-Level Engineering Support associated with Hardware and Software Engineering Support – All activities associated with the analysis, design, test, and implementation of hardware and software modifications, operational and support elements and sustainment of the NAS including site adaptation, wherever performed. This includes conducting studies for various stages of the support process, second-level support studies for software and hardware upgrades, critical operational problems, and system enhancements. It includes engineering analysis (including human factors analysis) of proposed modifications to determine feasibility, operational impact (functionality, availability, maintainability and reliability), implementation, and integration into operational systems. It also includes establishing an infrastructure to implement system upgrades and enhancements to include creating a program support facility, software development tools, licenses and maintenance, and test bed simulation.
- $181,000 for telecommunications – All activities associated with maintaining, upgrading, or modifying operational and administrative communications services required to sustain the operation and maintenance of the NAS facilities. It also includes leases and other recurring telecommunication costs.

The ASR-11 is the integrated primary and secondary radar deployed at terminal sites. The mission of the ASR-11 investment is to replace our aging airport radar systems with a single, integrated digital primary and secondary radar system. In the areas around airports, known as the terminal environment, air traffic controllers use radars to detect, locate, and track aircraft. Primary radars locate all aircraft, commercial and general aviation, with and without onboard transponders. Secondary radars locate aircraft that have transponders (usually commercial aircraft). Currently, the FAA has 225 terminal facilities that have both primary radar (ASR-9, ASR-8, or ASR-7), and a collocated, secondary radar (Mode-S, ATCBI-4, or ATCBI-5). The ASR-9 and Mode-S systems (average age 10 years) were deployed in the 1990's; ASR-8 (average age 20 years) and ATCBI-5 systems (average age 25 years) were deployed in the 1980s; and ASR-7 (average age 24 years) and ATCBI-4 systems (average age 30 years) were deployed in the 1970's.

The ASR-11 replacement combines four separate radar systems (ASR-7, ASR-8, ATCBI-4, and ATCBI-5) into one system that uses modern digital technology to support the air traffic control automation system in use today. New capabilities include digital output, LAN architecture for data distribution, remote certification and control, and both analog and digital solid-state components (i.e., no electron tubes). An additional feature is the six-level National Weather Service (NWS) calibrated weather capability—an improvement upon the very limited weather capability in the ASR-7/8 systems. ASR-11 radars detect and track aircraft and provide superior performance including ease of maintenance, increased system availability and reliability, and improved operational performance.

Location	Date Commissioned	Description
Saginaw, MI (MBS)	10/12/07	Replacement
Myrtle Beach, SC (MYR)	10/19/07	Replacement
North Valley, AZ (SDL)	11/5/07	Replacement
Macon, GA (MCN)	11/28/07	Replacement
Mobile, AL (MOB)	1/31/08	Replacement
Youngstown, OH (YNG)	2/13/08	Replacement
Champaign, IL (CMI)	3/7/08	Replacement
Midland, TX (MAF)	4/8/08	Replacement
Reading, PA (RDG)	5/1/08	Replacement
Velvet Peak, CA (QVP)	5/7/08	Replacement
Beaumont, TX (BPT)	5/9/08	Replacement
Little Rock, AR (LIT)	5/30/08	Replacement
Sioux City, IA (SUX)	5/30/08	Replacement
Panamint Valley	6/20/08	Replacement
Anchorage, AK (ANC)	6/22/08	Replacement
Amarillo, TX (AMA)	7/7/08	Replacement
Springfield, IL (SPI)	7/25/08	Replacement
Lexington, KY (LEX)	7/30/08	Replacement
Gulfport, MS (GPT)	8/29/08	Replacement
Corpus Christi, TX (CRP)	9/19/08	Replacement
Monterey, CA (MRY)	9/19/08	Replacement
Baton Rouge, LA (BTR)	9/26/08	Replacement

Without this funding, the ability and readiness of second-level engineering to provide support to field sites to maintain this newly-commissioned NAS prime mission equipment in the field could be reduced. The worst case would be that an operational ASR-11 system would be out-of-service for an extended period of time. Additionally, funds are required to continue telecommunication services until a successful baseline budget increase for F&E NAS Plan Handoff or OPS to sustain new services is approved for the Telecommunications Services Group (TSG).

S09.01-00 Airport Surface Detection Equipment – Model X (ASDE-X) – Beginning in FY 2010, FAA will incur costs in the Operations program for recurring operations and maintenance in the amount of $1,260,000:

- $43,000 for Logistics Support – This includes supply support activities and replenishment spares to support all fielded ASDE-X systems, including ordering, replenishing, exchanging, receiving, tracking, cataloging, and inventory management of replenishment spares needed in order to operate and maintain the ASDE-X systems at both the site and depot levels. This also includes activities related to packaging, handling, storage and transportation, and on-site space allocation of material.

- $657,000 for System Maintenance Support – This includes both site and depot level corrective maintenance and repair. FAA technicians maintain the systems at the sites but rely on the contractor to provide labor, facilities support equipment, material, packing, handling, storage, and transportation for depot level repair and support.

- $62,000 for Training – Included is all watch standing coverage and actual air traffic and technical operations personnel initial and attrition training requirements on-site, at the contractor's facility or at the FAA Academy.

- $498,000 for Infrastructure Upgrades - new service at the sites listed below.

These recurring costs are for support of three additional ASDE-X commissioned systems. The ASDE-X multilateration system includes remote units installed strategically throughout the airport to provide target position and identification reports for all aircraft and vehicles equipped with transponders. Multilateration is the process of determining a target's location in two or three dimensions by triangulating the transponder signal.

The ASDE-X system is designed to aid in the prevention of accidents resulting from runway incursions. ASDE-X is capable of processing three types of sensor data providing a robust surveillance picture consisting of three dimensional target locations, target identification, and universal time. The three sensor types of ASDE-X are independent (primary surface radar), cooperative (multilateration and secondary surveillance radar), and dependent (ADS-B) surveillance sources. Radar is used to provide the independent surveillance for all non-transponder equipped targets in line-of-sight of the radar antenna. Multilateration will provide target position and identification reports for all aircraft and vehicles having operational transponders. Automatic Dependent Surveillance - Broadcast (ADS-B) will provide accurate global positioning system (GPS) position reports for equipped aircraft. ASDE-X improves surface safety; provides surface situational awareness and positive identification of targets on the surface, including conflict detection and alerting; benefits ATC by providing a collaborative decision-making tool based on improved situational awareness; provides enhancements to increase the capabilities provided by the current ASDE-3/AMASS system; and improves the accuracy and timeliness of surveillance data. ASDE-X will reduce the risk of runway collisions, resulting in avoided fatalities, injuries, and aircraft damage and reduced taxi delays, resulting in aircraft direct operating cost savings and passenger savings. The ASDE-X system will be implemented at airports with no surface surveillance systems and airports with ASDE-3/AMASS systems.

ID	Region	Airport	Delivery	IOC
IAD	AEA	Washington Dulles International Airport	12/20/05	2/15/08
DTW	AGL	Detroit Metro Wayne County Airport	5/16/07	6/08
JFK	AEA	John F. Kennedy International Airport	1/4/08	8/08

If funding is not provided, the program would use capital dollars to accomplish activities normally performed with NPHO funds. This would reduce the capital funding available to continue implementation activities at the remaining sites and result in program schedule delays.

W07.01-00 Integrated Terminal Weather System (ITWS) – Beginning in FY 2010, FAA will incur costs in the Operations program for recurring operations and maintenance in the amount of $294,000:

- $16,000 for logistics support - FAA provides labor, facilities support equipment, material, packaging, handling, storage, and transportation for depot level repair and support.

- $64,000 for infrastructure support – proportion of funding utility and other infrastructure support costs.

- $134,000 for telecommunications – required for FTI connectivity between ITWS systems, sensors, and remote sites.
- $80,000 for systems operations – Volpe distributes weather products to approved FAA and non-FAA users not directly connected to the FAA system.

ITWS is an automated terminal-area weather data processor, which provides a unified set of safety and planning weather products to air traffic supervisors, traffic management specialists, and others on a local and regional basis. The ITWS information depicts current conditions and near-term (up to 1 hour) forecasts. ITWS information is disseminated to respective Towers, TRACONS, En Route Centers, and other users. ITWS integration and display of data from terminal weather sensors, remote weather sensors, and external processors provide analyses and short-term forecasts.

Location	Date Commissioned	Description
Cincinnati	October 2007	New
Detroit	January 2008	New
Phoenix	January 2008	New
Salt Lake City	February 2008	New
Philadelphia	March 2008	New
Cleveland	April 2008	New

If funding is not received, logistics support for Cincinnati and other ITWS systems would be reduced, creating a risk to service. In addition, fewer software updates will be performed across the NAS. Without telecommunications services, the ITWS systems will be inoperable.

Z0T.04-00, Integrated Display System (IDS) Model 4 – Beginning in FY 2010, FAA will incur costs in the Operations program for recurring operations and maintenance in the amount of $3,287,945:

- $372,963 for Logistics Support – This includes supply support activities and replenishment spares to support all fielded IDS systems, including ordering, replenishing, exchanging, receiving, tracking, cataloging, and inventory management of replenishment spares needed in order to operate and maintain the IDS systems at both the site and depot levels. This also includes activities related to packaging, handling, storage and transportation (PHS&T), and on-site space allocation of material.

- $1,752,189 for System Maintenance Support – This includes corrective maintenance and repair of all IDS-4 systems; and, system security assessments and audits. FAA technicians and second-level engineering personnel maintain the systems at the sites but rely on the contractor to provide telephone and/or on-site support for proprietary system software troubleshooting and modifications. Additionally, a security assessment is required annually to ensure that air traffic control information is safeguarded from improper access.

- $1,162,793 for Leased Telecommunications – This includes the maintenance and security of leased telecommunications services required to send weather data and operational control information to the IDS systems for use by air traffic controllers.

If funding is not provided, telecommunications services for system operation and support of the fielded systems would be eliminated. Without the telecommunications services, the systems would be inoperable. Without logistics and system maintenance support, failed equipment could not be returned to operating status, resulting in the loss of system services to the air traffic controller. Loss of system services eliminates the automated delivery of weather data, and immediate access to critical control information, which in turn will decrease controller productivity, increase airspace congestion and increase the risk of operational errors.

Vice President Technical Operations, AJW-0

The Technical Operations Service Unit (AJW) manages the infrastructure of the NAS. Its daily mission is to maintain more than 23,000 existing systems, based on latest inventory, as well as install hundreds of replacement and new systems throughout the United States. Technicians, trained in the upkeep and maintenance of this equipment, are the heartbeat of Technical Operations, providing the expertise to ensure that all systems necessary for the public to fly safely and on schedule are functioning properly. When implementing a new system, the legacy system must be maintained while the new equipment is installed and integrated into the NAS. Experienced personnel are critical in maintaining system integrity and NAS availability.

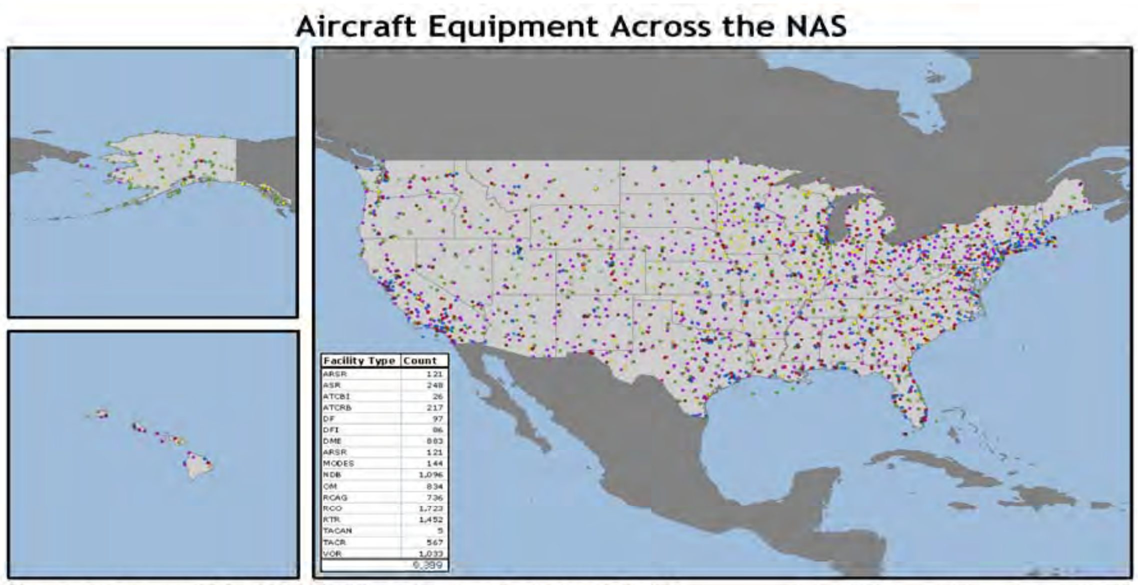
Acquisitions are also a part of AJW, with program offices involved in the development and purchase of communications and navigation systems. Technical Operations is on the cutting edge of air traffic technology, providing some of the most technologically-advanced system upgrades in the world. One example is the FAA's Wide Area Augmentation System (WAAS), a critical system that currently provides 1,445 Localizer Performance with Vertical Guidance (LPV) procedures. Production goals increase capability by 300 to 500 procedures annually, with a target of over 5,100 LPV procedures by year 2018.

From the pilots that fly the navigation test runs on new or upgraded equipment, to the program managers trying to make their programs more cost effective, or the planners trying to make sense of future spectrum allocations, Technical Operations is the most varied service unit in the ATO.

Vice President Technical Operations, AJW-0

	FY 2008 Actual	FY 2009 Estimate	Unavoidable Changes	Discretionary Changes	FY 2010 Request
Funding ($000)					
PC&B	1,018,606	1,105,898	42,502	460	1,148,860
Other Objects					
Travel/Transportation	43,302	43,165	217	0	43,382
Other Services	505,013	433,876	2,473	-276	436,073
Rent/Communications/Utilities	331,269	319,868	1,616	-8,700	312,784
Other	126,037	119,591	606	0	120,197
Subtotal	1,005,621	916,500	4,912	-8,976	912,436
Total	2,024,227	2,022,398	47,414	-8,516	2,061,296
Staffing					
End-of-Year	8,429	8,380	0	20	8,400
Full-time Equivalent Employment	8,787	8,739	0	6	8,745

The Technical Operations Service Unit requests a net increase of $38.9 million. This includes an addition of $42.5 million for basic pay raises and $4.9 million in non-pay inflation. NextGen staffing increases of $1.2 million are for 17 additional staff. Two base transfers to other FAA lines-of-business in the FAA reduce the budget by $1.0 million to better align our resources. Savings of $8.7 million reflect a decrease in the rents and utilities for the service unit.



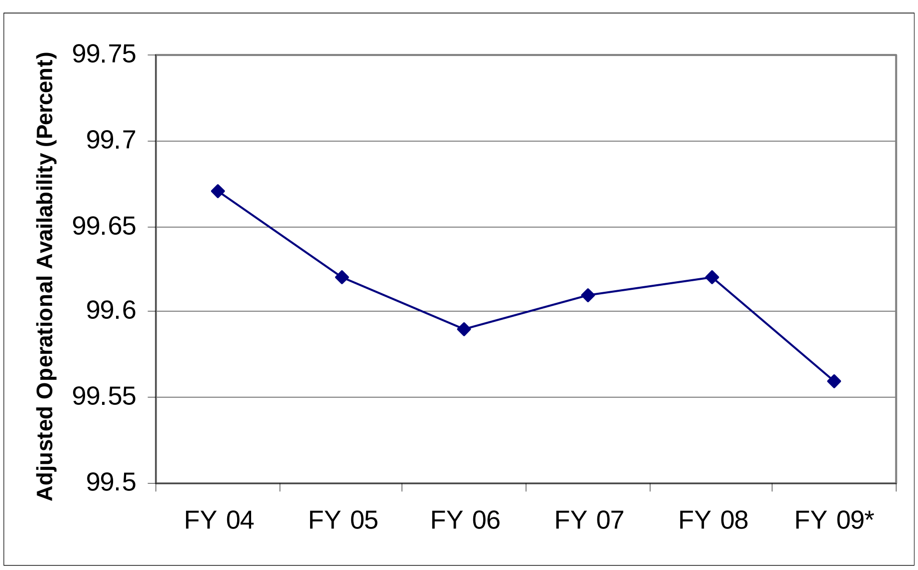
These graphics represent 9,389 of 64,312 facilities and equipment maintained by the FAA.

Produced by FAA Aeronautical Information Management (AJR-32)
May 25, 2006

The NAS is an inherently complex system, with multiple levels of redundancy to assure availability of key services. Technical Operations Service has established the following target for this performance goal:

- Sustain Adjusted Operational Availability at 99 percent for reportable facilities that support the NAS.

Adjusted Operational Availability of NAS Capabilities:



Systems Maintenance Field Maintenance Performance Indicators

Fiscal Year	Number of Facilities**	Adjusted Operational Availability	Reliability
2004	22,561	99.67%	99.89%
2005	22,792	99.62%	99.90%
2006	22,860	99.59%	99.85%
2007	22,637	99.62%	99.84%
2008	22,611	99.62%	99.84%
2009*	22,855	99.56%	99.85%

Notes: *FY 2009 data thru February 28, 2008
**Operational facilities deemed reportable in FAA Order 6040.15, "National Airspace Performance Reporting System."

<u>Vice President System Operations (AJR-0)</u>

Critical to each day's successful air traffic flow, the conversations held every two hours between the major airlines and specialized FAA personnel located at the David J. Hurley Air Traffic Control Systems Command Center (ATCSCC) were the result of decades of lessons learned. System demand outstrips capacity on many days as weather, airport delays, special use restrictions, and security inflate and contract airspace corridors all over the country. ATCSCC personnel maneuver streams of aircraft over and around these obstacles by an almost constant flow of available data being provided to controllers, while also closely coordinating their actions and recommendations with the airline home offices.

AJR balances situation-specific airflow needs with issues of altitude, noise abatement, speed, and direction, ensuring optimum use of airports with minimum public concern. AJR is implementing new routes and procedures that leverage emerging aircraft navigation capabilities, including Performance-Based Navigation (PBN). PBN is a framework for defining navigation performance requirements that can be applied to an air traffic route, instrument procedure, or defined airspace. PBN includes both Area Navigation (RNAV) and Required Navigation Performance (RNP) specifications. PBN facilitates more efficient design of airspace and procedures which collectively result in improved safety, access, capacity, predictability, operational efficiency, and environmental effects.

AJR is responsible for authorizing unmanned aircraft (UA) operations in the National Airspace System (NAS) to ensure that approvals to fly UA do not compromise the high level of safety for other aviation, the public, and property on the ground.

The AJR Wake Turbulence Program manages the research and analysis to ensure both safety and efficiency standards reflect the best current knowledge. The state of the art is reviewed in light of technological advancements, such as light detection and ranging (LIDAR) equipment and the introduction of new aircraft such as the Airbus A380 and Boeing B747-800.

AJR Obstruction Evaluation Services (OES) conducts aeronautical studies as contained in Subpart C, Title 14, Code of Federal Regulations, Part 77, and in FAA Order 7400.2, Procedures for Handling Airspace Matters. Obstruction evaluation (OE) studies ensure the safety of air navigation and the efficient use of navigable airspace. Aeronautical studies evaluate the effect of the construction or alteration on air traffic operating procedures; determine the potential hazardous effect of the proposed construction on air navigation; identify mitigating measures to enhance the safe and efficient use of the navigable airspace; and recommend marking and lighting configurations as well as charting of new objects to enhance pilot conspicuity.

Equally important are the requirements for AJR to coordinate with the Departments of Homeland Security and Defense, as well as other Federal and state partners, to protect the United States and its interests from threats. AJR is responsible for mitigating the impact of aviation-related threats to national defense, homeland security, natural disasters, and disruptions to air commerce and the associated response measures (for example, airport terminal shutdowns) on the safety and efficiency of the country's aviation system. AJR uses a broad range of air traffic management tools (for example, temporary flight restrictions) to carry out this mission using air traffic controllers that are dedicated to security functions to help quickly resolve potential airborne and other threats involving the NAS.

AJR is responsible for Notices to Airmen (NOTAM), a notification system relaying airspace closings, airport reconfigurations, and security conditions to general aviation pilots, making AJR the pivot point in flow management and coordination of security measures.

Flight service stations (FSS) collect and disseminate aeronautical and meteorological information, providing customized pre-flight and in-flight services to the domestic and international general aviation communities, as well as to military, air carriers, and Federal and local law enforcement. These services are provided to pilots by telephone, radio, the Internet, and face-to-face meetings.

In FY 2006, Lockheed Martin began providing these services (funded by FAA) for the continental U.S., Hawaii, and Puerto Rico. Equipment maintenance for all Government-furnished equipment (GFE) was provided by FAA through 2007. Beginning in FY 2008, FAA provides maintenance only on mandatory GFE, which includes FAA telecommunications infrastructure (FTI) and the remote communication outlets. The FAA will also continue to support the five FAA-owned flight service buildings in which the service provider will maintain a presence. Three automated flight service stations (AFSS) and 14 non-automated FSSs in Alaska remain Government-operated. The automation system was enhanced in Alaska in FY 2007 to mitigate information security and data integrity issues, and there was a software technical refresh in FY 2009 to replace the operating system. This enhancement will provide a bridge to Alaska Flight Service Modernization (AFSM) which is within the Acquisition Management System process.

AFSS contract costs will be $3.4 million lower in FY 2010, the fifth year of the Lockheed Martin contract. Lockheed Martin contract costs will account for $755.0 million (over the remaining five years of the contract) of the estimated $2.1 billion in total savings and cost avoidance over 13 years of this effort.

Performance-Based Navigation

Performance-based navigation (PBN) is a framework for defining navigation performance requirements (embodied in "navigation specifications") that can be applied to an air traffic route, instrument procedure, or defined airspace. PBN includes both Area Navigation (RNAV) and Required Navigation Performance (RNP) specifications. PBN provides a basis for the design and implementation of automated flight paths as well as for airspace design and obstacle clearance. Once the required performance level is established, the aircraft's own capability determines whether it can safely achieve the specified performance and qualify for the operation.

RNAV enables aircraft to fly on any desired flight path within the coverage of ground- or spaced-based navigation aids, within the limits of the capability of the self-contained systems, or a combination of both capabilities. As such, RNAV aircraft have better access and flexibility for point-to-point operations.

RNP is RNAV with the addition of an on-board performance monitoring and alerting capability. A defining characteristic of RNP operations is the ability of the aircraft navigation system to monitor the navigation performance it achieves and inform the crew if the requirement is not met during an operation. This on-board monitoring and alerting capability enhances the pilot's situation awareness and can enable reduced obstacle clearance.

Certain RNP operations require advanced features of the on-board navigation function and approved training and crew procedures. These operations must receive approvals that are characterized as Special Aircraft and Aircrew Authorization Required similar to approvals required for operations to conduct

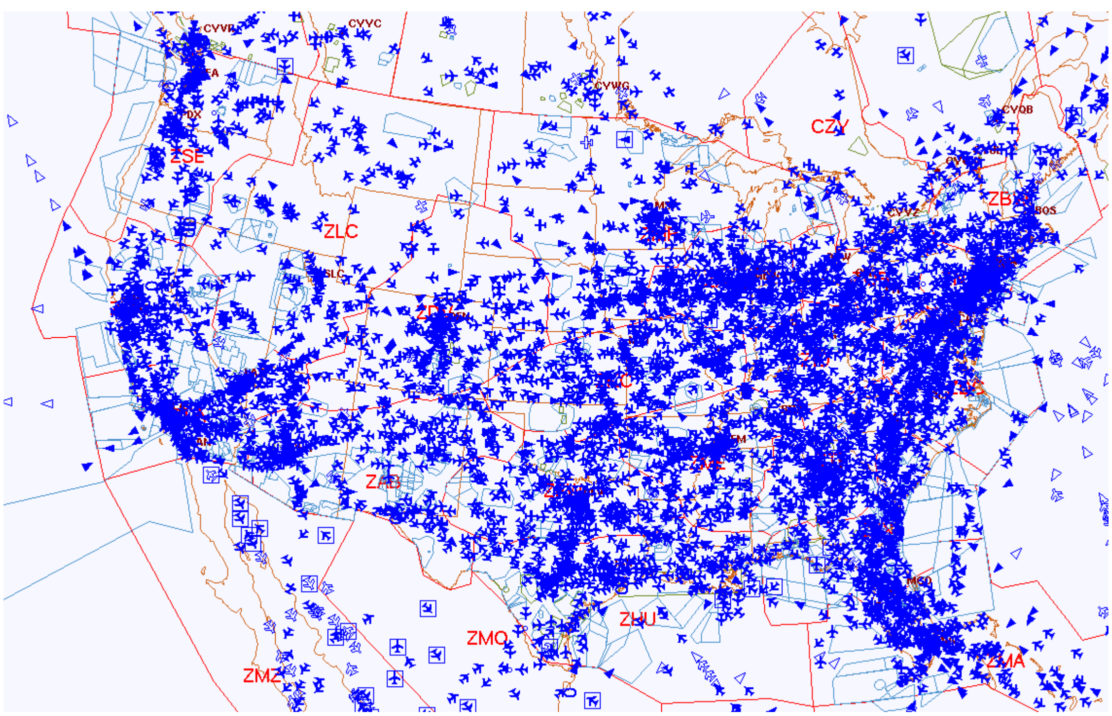
Instrument Landing System Category II and III approaches.

Vice President System Operations, AJR-0

	FY 2008 Allowance	FY 2009 Estimate	Unavoidable Changes	Discretionary Changes	FY 2010 Request
Funding ($000)					
PC&B	241,290	254,978	9,597	1,147	265,722
Other Objects					
Travel/Transportation	5,066	4,929	25	0	4,954
Other Services	327,438	298,132	8,867	0	306,999
Rent/Communicatons/Utilities	361	351	2	0	353
Other	2,843	2,766	14	0	2,780
Subtotal	335,708	306,178	8,908	0	315,086
Total	576,998	561,156	18,505	1,147	580,808
Staffing					
End-of-Year	1,285	1,285	0	27	1,312
Full-time Equivalent Employment	1,277	1,277	0	14	1,291

The System Operations Service Unit requests an additional $19.7 million, which includes $9.6 million for basic pay raises. Additionally, there is a request for $1.2 million for 17 NextGen staff. A Department of Labor wage determination requires an additional $1.3 million for the A-76 Flight Services Contract with Lockheed Martin. NAS Plan Handoff is $10.3 million, and non-pay inflation is $1.4 million. The budget for this service unit has been reduced by $4.0 million, which is a portion of the FY 2009 one-time addition for RNAV/RNP.

The chart below displays a snapshot of controlled aircraft in the system at a typical moment in time.



System Operations has a NPHO requirement of $10,256,000. This covers the following programs:

A05.01-06 Air Traffic Management – Traffic Flow Management Infrastructure – The Traffic Flow Management (TFM) system is a component of the NAS Architecture and provides the decision support systems and tools that help balance growing flight demands with NAS capacity within a dynamic environment. The TFM system hosts the software tools that are used to manage the efficiency of air traffic, to reduce delays and make maximum use of system capacity. The present TFM system has evolved through several generations of hardware and software. Its software has become increasingly difficult to maintain and modify and will not support emerging system requirements. The architecture platform is overly complicated, congested with multiple communication and network threads. The Traffic Flow Management Modernization (TFM-M) investment will modernize the Enhanced Traffic Management System (ETMS) hardware and software architecture.

This NPHO funding of $3,256,000 is needed to fund new equipment maintenance costs and software licenses as legacy equipment transitions out of the field.

M08.28-02 - Airspace Management Laboratory - Beginning in 2010, the FAA will incur costs in the Operations account for recurring operations and maintenance in the amount of $4,000,000 for the Airspace Management Laboratory.

The goal of the Airspace and Aeronautical Information Management (AIM) Laboratory is to field advanced information systems and decision support tools that allow FAA to cost-effectively manage the NAS without sacrificing service delivery or safety. The Laboratory uses operational research, statistical analysis, and modeling to evaluate potential NAS improvements. Subsequently, the Airspace and AIM Laboratory uses information management and process automation to provide new systems that improve safety, quality, and efficiency. Tangible results of Laboratory research can be seen in new technologies that improve the quality and efficiency of proposed and actual obstacle assessments.

Airspace and AIM Laboratory information management and workflow systems, decision support tools, airspace system data repositories, and international standards work provide direct and indirect cost savings to the FAA. Work completed by the Laboratory leads to:

- Cost savings through automation of manual data processing and evaluation activities;
- Cost savings by streamlining integration and coordination of multi-division work;
- Cost savings by providing decision makers with timely access to airspace system data; and
- Cost savings by leading the adoption of standards for electronic data sharing and distribution of FAA aeronautical data.

If funding is not provided, the FAA will be hampered in its ability to collect, analyze, and evaluate historical and current high fidelity traffic and airspace data on navigation aids, airspace, communication systems, routes and procedures. The Agency would be hindered in using this information to create customer products such as charts and publications as well as internal FAA products such as NAS modernization and improvement plans, environmental analyses, and infrastructure data needed to run the FAA ATC systems.

M08.28-04 - Airspace Management Program - Beginning in 2010, the FAA will incur costs in the Operations account for recurring operations and maintenance in the amount of $3,000,000 for the Airspace Management Program (AMP).

The AMP is the FAA initiative to redesign the nation's airspace, leveraging new technologies, equipage, infrastructure and procedural development to maximize benefits and system efficiencies. Modernization of airspace through AMP is characterized by the migration from constrained ground-based navigation to the freedom of a Required Navigation Performance (RNP)-based system.

The redesign of the nation's airspace is critical NAS modernization. Efficiently designed airspace allows users to get the full benefits of new technology, procedures and infrastructure (e.g., runways). Sector complexity and contention for airspace resources (e.g., departure fixes) cause a significant number of delays, restrictions and ultimately congestion. The Airspace Management Program (AMP) seeks to optimize terminal, en route and oceanic airspace by improving design and allowing users to use new technologies and procedures to increase efficient travel. This effort funds the development and implementation of sectors and routes.

If funding is not provided, the FAA's efforts to efficiently design and modernize the national airspace will be severely constrained.

Vice President Technical Training (AJL-0)

The Air Traffic Organization's vision is to be the global leader in delivering the safest and most secure air traffic services. The Office of Technical Training serves as the primary organization to develop and deliver technical training programs for a workforce of 15,400 air traffic controllers, 6,100 air traffic technicians, and other crucial technical ATO occupations needed to effectively accomplish the FAA mission. Our goal is to be at the forefront to deliver state-of-the art training solutions to meet our ever changing employee demographics and air travel requirements today and through the next generation of air traffic tomorrow.

Vice President Technical Training, AJL-0

	FY 2008 Actual	FY 2009 Estimate	Unavoidable Changes	Discretionary Changes	FY 2010 Request
Funding ($000)					
PC&B	45,754	51,996	1,982	-634	53,344
Other Objects					
Travel/Transportation	35,888	31,425	179	0	31,604
Other Services	130,747	102,557	-13,077	0	89,480
Rent/Communications/Utilities	137	120	0	0	120
Other	2,742	2,401	14	0	2,415
Subtotal	169,514	136,503	-12,884	0	123,619
Total	215,268	188,499	-10,902	-634	176,963
Staffing					
End-of-Year	378	379	0	0	379
Full-time Equivalent Employment	386	386	0	0	386

The Technical Training Service Unit budget has decreased by $11.5 million. While basic pay increases by $2.0 million, the budget is adjusted to exclude the FY 2009 one-time addition ($-13.7 million) from the Omnibus Act for accelerated training, offset by an increase of $0.8M for non-pay inflation on other services. The FY 2010 budget continues to fully fund agency requirements for new controller training. A base transfer from ATO to other FAA lines-of-business to better align our resources also reduces the budget by $0.6 million.

Vice President for Service Centers (AJV-0)

The three Service Centers provide shared services to promote standardization of processes, efficiency and effectiveness which achieve results for the En Route, Technical Operations, Terminal, and System Operations service units. Each Service Center is comprised of five groups: Administrative Services, Business Services, Planning and Requirements, Operations Support, and Safety Assurance. The shared services model brings people together with similar expertise, allows sharing of ideas, collaboration to improve processes, and enhances communication and sharing of resources. The Service Center is also an ATO contact point for other FAA organizations.

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The Service Center Service Unit requests $3.3 million, which includes $3.1 million for basic pay raises and $0.2 million for non-pay inflation.

Other ATO Staff Offices

Senior Vice President NextGen & Ops Planning – Next Generation Air Transportation System (NextGen) and Operations Planning Services executes the mission of the FAA and ATO and, as a member of the Executive Council, establishes ATO goals, system safety and security, long-term strategies, budgets, priorities and resource allocations that support continuous improvement of service value, and achievement of performance targets. NextGen and Operations Planning maintains the NextGen plan and develops planning documentation for member agencies and keeps internal and external customers of the FAA aware of NextGen status. This Service Unit transfers technology from research programs to federal agencies with operational responsibilities and to the private sector in order to optimize safety, capacity, and security, and reduce negative environmental impacts. It delivers research and technical development necessary to improve and evolve the NAS enterprise architecture to meet requirements and implement technologies identified in the NextGen Implementation plan to transition the NAS to meet forecasted demand and it delivers and monitors the execution of the FAA plan to integrate initiatives, activities and capabilities necessary for the implementation of the NAS of the future via the NextGen Integration and Implementation office. NextGen and Operations Planning establishes and manages the NAS architecture to ensure that it meets current and future service requirements; conducts planning, analyses, research, advanced concept development, new technology development and prototyping, and systems engineering to support initial and final investment decisions; executes the corporate research, engineering and development planning, and budget process for the Administrator; ensures that the laboratories, facilities and support services of the William J. Hughes Technical Center are available and appropriate to meet the requirements of the ATO and external customers; ensures that NAS systems and new acquisitions receive test, evaluation, verification and validation services, as appropriate, throughout their lifecycle; ensures that ATO planning activities are synchronized with internal and external partners and that they support future requirements; and develops, enhances and validates fast-time modeling tools to simulate and analyze airport/airspace capacities and overall NAS performance.

Senior Vice President Finance - Finance Services provides financial planning services, investment and business case evaluation, financial analysis services, identification and implementation of performance-based solutions for the agency, financial systems services (cost accounting), information technology support services and budget services for all appropriations in ATO. Finance Services sets ATO-wide standard operating procedures and serves as ATO liaison to FAA Chief Financial Officer. It also establishes and maintains information technology applications and services to support ATO and FAA operations. Finance Services also presents financial analysis services, financial metrics, comparative analysis, productivity measurements, investment, and business case evaluation and life cycle costing. It oversees and evaluates competitive sourcing activities.

Senior Vice President Strategy and Performance - The Air Traffic Organization's vision is to be the global leader in delivering the safest, most secure air traffic services while providing the greatest value to its customers, owners, and employees. The Strategy and Performance organization supports this vision by delivering internal and external services that enable ATO to effectively accomplish that mission. Products and services include: Organizational Effectiveness; Administrative Services; Strategy Development and Implementation; International Services; Finance, Planning, and Business Services; Performance Analysis and Strategy; Workforce Services; Leadership and Professional Development; Model Workplace and Diversity Services; and ATO Communications.

Office of Safety - The Office of Safety ensures the safety and success of the Air Traffic Organization by managing risks, assuring quality standards, and instilling an open culture of disclosure. The Office of Safety is also responsible for identifying and mitigating aircraft collision risks during the delivery of Air Traffic separation services by applying FAA's Safety Management System principles; auditing safety, quality assurance and quality control in the ATO and reporting findings to improve safety performance; integrate the functions and information of risk reduction, investigations, evaluations, independent operational testing and evaluation, safety risk management, runway safety and operational services in order to identify collision risks and influence their resolution; and provide information on assessments of operational and safety performance within the national airspace system.

Office of Acquisition and Business Services - The Air Traffic Organization's vision is to be the global leader in delivering the safest, most secure air traffic services while providing the greatest value to its customers, owners, and employees. The Acquisition and Business Services organization supports this vision by delivering internal services that enable ATO to effectively accomplish that mission. Acquisition and Business Services provides policy, services and products in the areas of acquisitions, contracts, quality assurance, and small business development to support the ATO and the FAA in meeting performance targets.

Other ATO Staff Offices*

	FY 2008 Allowance	FY 2009 Estimate	Unavoidable Changes	Discretionary Changes	FY 2010 Request
Funding ($000)					
PC&B	182,639	241,447	7,642	1,339	250,428
Other Objects					
Travel/Transportation	7,221	11,817	35	0	11,852
Other Services	221,402	251,108	-1,594	-31,631	217,883
Rent/Communications/Utilities	13,146	19,407	46	-7,000	12,453
Other	38,067	39,744	186	-3,429	36,501
Subtotal	279,836	322,076	-1,327	-42,060	278,689
Total	462,475	563,523	6,315	-40,721	529,117
Staffing					
End-of-Year	898	893	0	-8	885
Full-time Equivalent Employment	901	896	0	11	907

*Other ATO Staff Offices include: Acquisition and Business, Finance, Strategy and Performance, Safety, and NextGen and Operations Planning

The budgets of the ATO staff offices (which include Acquisition and Business; Safety; Strategy and Performance; NextGen and Operations Planning; and Finance) have decreased by $34.4 million, based in large part on cost savings and base transfers to better align our resources. Staff salary includes all basic pay raises ($7.6 million). Total non-pay inflation is $1.2 million. Additionally, the budget has been reduced by $2.5 million to delete the FY 2009 one-time addition for the Medallion Program. An additional 32 NextGen staffing in the AJP Service Unit requires a $2.1 million increase. Base transfers from ATO to other FAA lines-of-business to better align our resources also reduces the budget by $3.8 million. Cost savings for the staff offices are $39.1 million.

Explanation of Funding Changes for Air Traffic Organization (ATO)

	Dollars ($000)	FTE
Air Traffic Organization (Net change from FY 2009 Enacted)	**$204,417**	**237**
Overview: For FY 2010, ATO requests $7,302,739,000 and 32,079 FTEs in the Operations appropriation to meet its mission of moving air traffic safely and efficiently. This is an increase of $204,417,000 (2.9 percent) and 945 FTE (0.3 percent) from the FY 2009 enacted level. The FY 2010 request level reflects unavoidable pay raises and inflation; other uncontrollable adjustments such as NAS Handoff requirements, contract costs for the Contract Tower and Contract Weather Observation Programs, and staffing increases for NextGen and to prepare for the air traffic controller "retirement bubble" and nine base transfers to other FAA organizations. The FY 2010 FTE request level consists of annualization of FY 2009 air traffic controller hiring, a net increase of 107 air traffic controllers (53 FTE) in FY 2010, and a decrease of 21 FTEs resulting from base transfers to other lines of business.		
FY 2009 One-Time Items		
Additional RNAV Procedures, Medallion Program, and Controller Workforce Training Support A $20.2 million reduction is taken from the FY 2009 enacted level for one-time costs associated with RNAV Procedures (-$4.0 million), the Medallion Program (-$2.5 million), and controller workforce training (-$13.7 million). After a quick ramp up in FY 2009, the ATCOTS training system is operating near end-state and should level off in FY 2010.	-20,226	0
Unavoidable Adjustments		
Annualized FTEs: This represents the net annualized costs of FY 2009 new hires and attrition.	13,129	153
Annualized FY 2009 Pay Raise (GS Population): This pay raise has been calculated separately based on the employee population still under the General Schedule. This increase is needed to provide for the full-year cost associated with the 3.9 percent average government-wide pay raise in January 2009. The actual factor used is 4.8 (3.9 percent plus 0.9 percent average of Within-Grade increases). The FY 2009 portion of this pay raise will be absorbed within enacted amounts; this increase covers the first quarter of FY 2009.	3,138	
Annualized FY 2009 Pay Raise (Core Comp Population): This pay raise has been calculated separately based on the employee population under the Core Compensation pay plan. This increase is needed to provide for the full-year cost associated with the Organizational Success Increase (OSI) and the Superior Contribution Increase (SCI) awarded in FY 2009. The OSI is 100 percent of the	53,104	

	Dollars ($000)	FTE
3.9 percent average government-wide pay raise plus 1.0 percent (4.9 percent). The Core Compensation system awards three different pay raises—20 percent of the population receive the OSI plus a 1.8 percent SCI, 45 percent receive the OSI plus a 0.6 percent SCI, and 35 percent receive just the OSI. The FY 2009 portion of this pay raise will be absorbed within enacted amounts; this increase covers the first quarter of FY 2010.		
FY 2010 Pay Raise (GS Population): This pay raise has been calculated separately based on the employee population under the General Schedule. This increase is required to provide for costs associated with base salary increases. The factor used is 2.9 percent, composed of the projected 2.0 percent government-wide pay raise in January 2010 plus 0.9 percent average of Within-Grade increases.	7,184	
FY 2010 Organizational Success Increase (OSI) (Core Comp Population): This pay raise has been calculated separately based on the employee population under the Core Compensation pay plan. This increase is required to provide for costs associated with base salary increases that are provided to employees meeting or exceeding job expectations. The factor used is 3.0 percent, composed of the projected 2.0 percent government-wide pay raise in January 2010 plus 1.0 percent for the full OSI increase (derived from the elimination of Within-Grade increases). A fundamental component of the FAA's pay-for-performance system, this increase assumes FAA will meet most of its FY 2009 performance goals.	105,505	
FY 2010 Superior Contribution Increase (SCI): This increase is required to provide for costs associated with base salary increases that are provided to employees in the Core Compensation system providing superior contributions to the organization. The factor used is 1.8 percent for 20 percent of the population and 0.6 percent for 45 percent of the population. The remaining 35 percent do not receive this increase.	22,156	
Non-Pay Inflation: This increase is needed to provide for inflationary cost increases consistent with OMB guidance that uses the FY 2010 GDP price index (year over year) of 0.5 percent.	10,294	
Uncontrollable Adjustments		
NAS Handoff Requirements: This $42.6 million request consists of the following four components, with their corresponding amounts:	42,636	

	Dollars ($000)	FTE
Logistics Support: All activities associated with depot level support to NAS prime mission equipment and associated support equipment. Major systems include Integrated Display Systems Technology Refresh and Sustainment and Training Simulator.	540	
Second-Level Field Maintenance Support: All activities required for the in-service management phase, including directly operating, providing maintenance functions (both scheduled and unscheduled), and furnishing technical and logistics support for maintenance of FAA systems, sub-systems, services or equipment. All engineering activities in support of the delivery of service, to include development of modifications, documentation, testing and implementation of technology refresh initiatives. Also includes associated travel time required to support systems. Major systems include Terminal Facility Sustain, Terminal Automation Sustain, and En Route Facility Sustain.	39,590	
Leased Telecommunications: All activities associated with maintaining, upgrading, or modifying operational and administrative communications services required to sustain the operation and maintenance of the NAS facilities. It also includes leases and other recurring telecommunication costs. Major system is Integrated Display Systems Technology Refresh and Sustainment.	1,766	
Training: All activities associated with on-the-job training, attrition training, and refresher training of personnel who directly operate, maintain, or provide support functions. This includes contractor provided costs associated with specific training. Training costs include course conduct (including instructor and facilities costs), travel, and per diem costs for students. Major systems include Airport Surface Detection Equipment – Model X (ASDE-X) and Training Simulator.	740	
DOL Wage Determination Increases: Based on annual DOL wage determination increases, there are three contributors to the uncontrollable adjustments of the FY 2010 Operations budget—AFSS A-76 Contract Labor Cost Increase, Contract Tower Program, and Contract Weather Observation Program. The increases are described below: AFSS A-76 Contract Labor Cost Increase - A recent wage determination made by DOL has required that the Automated Flight Service System change its wages and benefits. A total of $1.2 million is being requested. Contract Tower Program - A $5.2 million increase is needed to fund the cost of new sites added in FY 2009 as well as annual Department of Labor (DOL) wage determination increases, which average between 4.5 and 5.0 percent per year. The yearly wage rate increases set by DOL are non-negotiable, and must be incorporated into contract-tower contracts in order to comply with labor regulations. In light of the current economic slowdown, FAA expects that forecasts of both commercial aircraft operations and non-commercial activity to be substantially below prior forecasts. FAA updated and released its forecasts of activity at contract-towered airports in March 2009.	9,352	

	Dollars ($000)	**FTE**
Contract Weather Observation (CWO) Program - A $2.9 million increase is needed to address annual DOL wage determination increases, which average between 4.5 and 5.0 percent per year, affecting both the CWO vendor contracts as well as the Program Office support contracts. These contracts account for the majority of funding requirements for the CWO program. The yearly wage rate increases set by DOL are non-negotiable and must be incorporated into each CWO contract in order to comply with labor regulations.		
Discretionary Increases		
Air Traffic Controller Hiring: The FAA requests $4.5 million to hire and train a net increase of 107 new controllers (53 FTE) in FY 2010. This hiring number is consistent with the updated Controller Workforce Plan. From 1982 through 1991, the FAA hired an average of 2,655 new controllers per year as it began the massive task of rebuilding the controller work force following the 1981 strike. In the last 3 years, the FAA has hired more than 5,500 new air traffic controllers, and we are on target to meet our future requirements. As the FAA continues to bring these new employees on board, we must carefully manage the process to ensure that our trainees progress in a timely manner and are hired in the places we need them. In the next decade, FAA must hire almost 15,000 air traffic controllers. The FAA staffs to traffic, which enables the flexibility to align staffing with traffic volumes. Traffic has fallen 17 percent since the peak in 2000, and is not expected to return to peak levels in the near term. Despite that reduction, FAA plans to hire about 1,500 controllers per year to stay ahead of the training requirements for new controllers who will replace retiring controllers over the next decade. There are as many controllers on board today as there were in 2000, including thousands of trainees, and adjusted for traffic levels, there are more CPCs on board today than in 2000. In December 2004, FAA issued its 10 year strategy for future controller staffing in the report to Congress, *A Plan for the Future: The FAA's 10-Year Strategy for the Air Traffic Control Workforce.* FAA sent an Interim Plan to Congress in March 2009. The detailed annual update accompanies the FY 2010 budget submission. The plan describes how FAA will hire, staff, and train controllers. The plans also highlight the steps FAA is taking to place the right number of controllers in the right place at the right time to maximize the safety and efficiency of the NAS. Staffing to traffic gives FAA the flexibility to match the number of controllers at its facilities with traffic volume and workload. The staffing targets contained in the updated Plan will be revised to reflect retirement and traffic projections. Bringing aboard new controllers is a complex, time-consuming process. It takes several years to train a controller and the agency needs to constantly add to its pool of qualified recruits and trainees. Filling the	4,548	53

	Dollars ($000)	FTE
job of a controller who retires today is the culmination of a process that must begin, by necessity, several years in advance. In the past, the process required 3 to 5 years. By improving our training techniques and using high-fidelity simulators, we have reduced the training period to 2 to 3 years. The FAA's goal is to limit the controller-to-trainee ratio to less than 35 percent of the workforce. This will ensure there are adequate numbers of fully trained controllers in all facilities. Fully certified controllers not only control air traffic; they also train developmental controllers. The $4.548 million request supports hiring for a net increase of 107 air traffic controllers in FY 2010, a level consistent with the updated staffing plan.		
NextGen Staffing Increase: The FAA contracted with the National Academy of Public Administration (NAPA) to identify the skill sets required to integrate and implement the Next Generation Air Transportation System (NextGen) into the NAS. NextGen staffing for the ATO operations organization is most critical in the Operations Planning (AJP) and En Route (AJE) organizations. The AJP vice president, who is responsible for NextGen integration and implementation, is preparing to bring on-board new program managers, analysts, and scientists to support the accelerated NextGen program. Many of the 104 staff requested in FY 2010 will generate the policies needed to move the program forward. A transformation must take place that will establish strategies to obtain the expertise necessary to manage, integrate, and implement these complex activities. Additionally, the operational organizations will be involved in concept review and validation, prototyping analysis, review and validation; human factors review and validation; requirements analysis and validation; training assessment and development; and procedural analysis, review, and development/modifications.	7,000	52
Cost Efficiencies		
Rents, Utilities, Leases: ATO Technical Operations (AJW) organization is the resident organization for Engineering Services, the last of the groups being consolidated under the service center consolidation effort. As staff relinquishes facility space, rents, utilities, and leases decrease.	-8,700	
Service Center Business Process Reengineering: ATO Service Center (AJV) organization has effectively lowered its costs by continuing to consolidate its staff and facilities. Business process reengineering efforts at the Service Centers have continued to increase efficiency.	-16,000	

	Dollars ($000)	FTE
Administrative Overhead Efficiencies: ATO is confident that we can continue recent efforts to streamline administrative operations and achieve a considerable reduction. This reduction is attributable to program savings, staffing efficiencies, and utilization of contracts such as SAVES. We continue to consolidate the overhead function in headquarters, and are pursuing additional savings by centralizing the procurement of supplies and equipment.	-23,306	
Base Transfers		
Air Traffic Controller Hiring Support: A significant percentage of the air traffic controller workforce will become eligible to retire in the next decade. To address this challenge, the FAA will hire approximately 17,000 new air traffic controllers over the next 10 years. The requirement to continue to support a significant amount of air traffic controller hiring will be on-going for a minimum of the next 10 years. In support of the air traffic controller hiring, ATO will transfer $331,000 and four FTEs to the Human Resource Management Office (HMRO) at the Aeronautical Center.	-331	-4
Automated Staffing and Application Process (ASAP) System Enhancements: To meet the demands of the Air Traffic Controller Workforce Plan, the ATO must be able to efficiently hire and track new employees. Our corporate automated tool for hiring and tracking is ASAP. This system, based on changing requirements, must be refreshed and enhanced. To support this requirement, ATO will transfer $148,000 and one FTE to Office of Human Resources.	-148	-1
Technical Library: Beginning in FY 2010, the ATO will transfer $651,000 and two FTEs to the Office of Chief Counsel (AGC). In addition to funding two FTEs, $429,060 for periodicals will also be reallocated. The transfer will reassign this administrative function to the most appropriate FAA organization.	-651	-2
Panorama Business Views (PBViews): FAA's Strategic and Business Planning are now fully incorporated into the agency's management process. In order to manage the FAA's Strategic and Business Planning program, the Office of Aviation Policy, Planning, and Environment is requesting a base transfer of funds. The ATO is transferring $963,000 to support this process.	-963	0

	Dollars ($000)	**FTE**
Tech Ops Hiring: AHR has centralized all external hiring for field technicians in the Human Resource Management Division (HRMD) at the Aeronautical Center. The centralization of hiring will benefit the agency as it will streamline the coordination between ATO-W, AHR, Security, Aviation Medicine, and the FAA Academy, reducing time and duplication efforts. In support of the centralization of Tech Ops hiring, ATO will transfer $450,000 and two FTEs. This funding will cover not only the PC&B for the two FTEs, but also contract support that provides administrative support for air traffic controller hiring.	-450	-2
Litigation Support: Beginning in FY 2010, ATO agrees to transfer five FTEs, with associated funding, to the Office of Chief Counsel. The positions are: Associate Chief Counsel for the Air Traffic Organization; three positions to support the ATO's Service Centers; two positions to assist the ATO in accomplishing its congestion management initiatives and assure agency compliance with environmental laws; and the three remaining positions to assist ATO in accomplishing its NextGen initiatives, including the necessary rulemaking and acquisition work required.	-2,000	-5
Emergency Communications: As a result of the after action reviews conducted by the FAA in the wake of September 11, 2001, attacks, the Office of Emergency Communications (AEO-400) in the Office of Security and Hazardous Materials (ASH) has been tasked with consolidating management and programmatic control of all of the FAA's emergency communications, and command and control infrastructure. AEO-400 will provide full life-cycle support of each functional location it manages in order to effectively provide a location where the FAA can provide essential services during a national crisis, as directed in FAA Orders 1900.1 and 1010.1. Therefore, in FY 2010, ATO will transfer to ASH four current employees and one vacant FTE, along with the appropriate funding.	-514	-5
FAA Historian: The ATO will transfer one FTE and the associated personnel, compensation, and benefits to AGC for the position of FAA Historian.	-184	-1
Clinical Psychologist: As the air traffic controller hiring process continues, many of the original screening processes are being upgraded, including the initial applicant psychological testing. The current psychological test, the 16PF, is being replaced with the Minnesota Multipasic Personality Inventory-2	-156	-1

	Dollars ($000)	FTE
(MMPI-2). To facilitate this effort, the Office of Aerospace Medicine (AAM), the responsible organization for incoming testing, is hiring a licensed clinical psychologist. The ATO has agreed to transfer the appropriate funding and position in support of this controller hiring workload.		

Traditional Tables for Air Traffic Organization (ATO)

The following pages represent information traditionally provided to the Committee on Appropriations for the FAA's air traffic control functions.

Controller Workforce FY 1981 Through FY 2009

FY 1981	6,578	FY 1989	14,340	FY 1997	14,588	FY 2005	14,540
FY 1982	11,290	FY 1990	14,645	FY 1998	14,966	FY 2006	14,618
FY 1983	11,980	FY 1991	14,976	FY 1999	15,096	FY 2007	14,874
FY 1984	12,213	FY 1992	15,147	FY 2000	15,153	FY 2008	15,381
FY 1985	12,968	FY 1993	14,970	FY 2001	15,233	FY 2009 Est.	15,585
FY 1986	12,615	FY 1994	14,953	FY 2002	15,478	FY 2010 Req.	15,692
FY 1987	13,007	FY 1995	14,614	FY 2003	15,691		
FY 1988	13,960	FY 1996	14,360	FY 2004	14,934		

NOTES:
(1) Actuals include Controllers and Academy students
(2) FY 1986 thru FY 1988 data as if October 31st. September reports were not available for those years.

System Maintenance Overtime ($000)

		2008 Actual	2009 Estimate	2010 Request
Field Maintenance				
	Hours	329,306	340,667	348,588
	Amount	20,812	21,530	22,031
Program & Technical Support				
	Hours	47,973	49,628	50,781
	Amount	2,667	2,759	2,823
TOTAL				
	Hours	377,279	390,295	399,368
	Amount	23,479	24,289	24,854

NAS PLAN HAND-OFF
(Dollars in Thousands)
Air Traffic Organization

	CIP	Service Unit	NAS Logistics	Systems Maintenance	Training	Leased Telecom	Flight Inspection	Security & Haz Materials	Aviation Safety	Total
F06.01-00	En Route Facility Sustain	EnRoute	0.0	9,189,000.0	0.0	0.0	0.0	0.0	0.0	9,189,000.0
										9,189,000.0
A05.01-06	TFM Modernization	System Ops	0.0	3,256,000.0	0.0	0.0	0.0	0.0	0.0	3,256,000.0
M08.28-02	Airspace Management Lab	System Ops	0.0	4,000,000.0	0.0	0.0	0.0	0.0	0.0	4,000,000.0
M08.28-04	Airspace Management Program	System Ops	0.0	3,000,000.0	0.0	0.0	0.0	0.0	0.0	3,000,000.0
										10,256,000.0
S03.02-01	Terminal Radar (ASR) Program - ASR-11 - ASR-7/ASR-8 Replacement, DOD Takeover, New Establishments	Terminal	0.0	143,000	0.0	181,000	0.0	0.0	0.0	324,000.0
A03.04-01	Terminal Automation Sustain	Terminal	0.0	6,085,000	0.0	0.0	0.0	0.0	0.0	6,085,000.0
F01.01-00	Terminal Facility Sustain	Terminal	0.0	9,790,532	0.0	0.0	0.0	0.0	0.0	9,790,532.0
S09.01-00	Airport Surface Detection Equipment - Model X (ASDE-X)	Terminal	43,000	867,000	62,000	288,000	0.0	0.0	0.0	1,260,000.0
W07.01-00	Integrated Terminal Weather System (ITWS) - ITWS Development/Procurement	Terminal	16,000	144,000	0.0	134,000	0.0	0.0	0.0	294,000.0
M20.01-00	Training Simulator	Terminal	108,000	1,364,000	678,000	0.0	0.0	0.0	0.0	2,150,000.0
Z0T.04-00	Integrated Display Systems Technology Refresh and Sustainment (IDS4)	Terminal	372,963	1,752,189	0.0	1,162,793	0.0	0.0	0.0	3,287,945.0
										23,191,477.0
	Total		**539,963.0**	**39,590,721.0**	**740,000.0**	**1,765,793.0**	**0.0**	**0.0**	**0.0**	**42,636,477.0**

OPERATIONS APPROPRIATION

Aviation Safety (AVS)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2009 Enacted (Omnibus)	**1,164,597**	**7,184**	**110**	**7,021**
FY 2009 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	13,156			83
2. Annualized FY 2009 Pay Raise (GS Population)	5,283			
3. Annualized FY 2009 Pay Raise (Core Comp Population)	4,144			
4. January 2010 Pay Raise (GS Population)	12,096			
5. January 2010 OSI (Core Comp Population)	8,234			
6. January 2010 SCI	1,729			
7. Non-pay inflation	1,196			
8. GSA Rent Increase	0			
Total Unavoidable Adjustments	**45,838**	**0**	**0**	**83**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. DOL Wage Determination Increases	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. Air Traffic Controller Hiring	0			
2. NextGen Staffing Increase	0			
3. UAS / Drug Inspector Staffing Increases	2,604	30		15
4. AVS Analytical Program Staff Increases	480	6		3
5. ASIAS Contract Support	3,720			
6. NextGen Environmental/Noise	0			
7. Congestion Studies	0			
8. National Security Systems Classified/ Controlled Information	0			
9. National Security Coordination Division/ Counter Intelligence	0			
10. Equal Employment Opportunity (EEO) and Civil Rights Programs	0			
11. FAA Privacy Program	0			
12. Automated Staffing and Processing (ASAP)	0			
13. Financial Systems Upgrades	0			
Total Discretionary Increases	**6,804**	**36**	**0**	**18**
Cost Efficiencies				
1. Rents, Utilities, and Leases	0			
2. Service Center Business Process Reengineering	0			
3. Administrative Overhead Efficiencies	0			
Total Cost Efficiencies	**0**	**0**	**0**	**0**
Base Transfers				
1. Air Traffic Controller Hiring Support	0			
2. Automated Staffing and Application Process (ASAP) System Enhancements	0			
3. Labor Relations Improvements	-158	-1		-1
4. Technical Library	0			
5. Office of Audit and Evaluation	-693	-6		-6
6. Panorama Business Views (PB Views)	-149			
7. Tech Ops Hiring	0			
8. Litigation Support	0			
9. Emergency Communications	0			
10. FAA Historian	0			
11. Clinical Psychologist	156	1		1
12. Acquisition Support (AMQ) to Franchise Fund	0			
Total Base Transfers	**-844**	**-6**	**0**	**-6**
FY 2010 Request	**1,216,395**	**7,214**	**110**	**7,116**

Detailed Justification for Aviation Safety (AVS)

Aviation Safety	FY 2010 Request: $1,216,395

Overview:

The Associate Administrator for Aviation Safety (AVS) has a singular mission: to provide the safest, most efficient aerospace system in the world.

In 1997, the White House Commission on Aviation Safety and Security issued a challenge to FAA and the aviation industry – reduce the air carrier fatal accident rate by 80 percent in ten years. In response, FAA initiated a joint government-industry analysis of causal factors most frequently involved in aviation accidents. The resulting document, Safer Skies – A Focused Agenda, has formed the basis for joint government-industry efforts to reduce the number of accidents in both the commercial and general aviation areas.

By the end of FY 2007, we achieved a rate of 0.023 fatal accidents per 100,000 departures – a 57 percent reduction. Although we did not achieve the bold target set over ten years ago, this achievement is hardly a failure. In the three years prior to setting this goal, the United States averaged about six commercial fatal accidents per year. The average loss of life each year was 266 deaths.

Today, thanks to new technology, revised rules and procedures, and increased training, not only are there fewer commercial fatal accidents each year, but the chances of survival have increased significantly. In the past three years (FY 2006 through FY 2008) the United States averaged approximately 2.7 fatal accidents per year, with an average loss of life of 26 per year.

In addition, our efforts from the past ten years have also improved our goals on reducing general aviation (GA) fatal accidents. There were 313 fatal general aviation accidents in FY 2007, achieving our target of less than 331 accidents. For FY 2008, there were 301 fatal general aviation accidents, again achieving our target of less than 325 accidents.

Through the continuing effort and cooperation of all the participants in the aviation industry and FAA, we have achieved the safest period in aviation history.

For this reason, we unveiled a new performance metric in FY 2008 for commercial air carrier safety – Fatalities per 100 Million Enplanements. This new metric is more relevant to the flying public, as it better measures the individual risk, as low as it is, to fly. And the long-term target is no less challenging – we aim to cut this risk in half by FY 2025. We will continue to work in partnership with industry to make this vision a reality.

For FY08, the FAA exceeded its target of 8.7 and achieved a rate of .4 fatalities per 100 million persons on board.

AVS's ability to help maintain this exemplary safety record—while providing necessary services to the growing U.S. aviation industry—continues to be a challenge. Facing increased demand for services, AVS must continue to provide the proper surveillance and oversight for a complex, global, and rapidly changing aerospace system. AVS is also challenged with helping the industry grow and compete with new equipment, technologies, and markets.

AVS takes a systems view of safety—using a risk management approach to focus resources efficiently and effectively on significant safety concerns. Safety is a continuum—and the success of the entire safety system depends on effective management in each and every phase. The three phases of the safety continuum are:

1. Continued Operational Safety – AVS's fundamental work is the surveillance and oversight of existing certificate holders. AVS assures original certification requirements are continually maintained. This is the most important element of what AVS does.
2. Setting Standards – AVS develops and establishes the safety and certification standards for the industry. By meeting those standards, the people and organizations that manufacture, operate and maintain the aerospace system have achieved a safety record that is unparalleled.
3. Issuing Certifications – AVS determines compliance with standards and issues certifications. The

aviation industry depends on AVS to approve products that enhance safety and increase capacity, while giving the industry the means to succeed in an intensely competitive international market.

AVS aims to provide the highest level of aviation safety while meeting the needs of an extensive customer base, which includes:

- Over 722,000 pilots;
- Over 363,000 mechanics;
- Approximately 6,100 operators;
- Over 1,600 manufacturers of aircraft, equipment, avionics, and other aviation-related items; and
- A fleet of roughly 227,000 active aircraft.

AVS is committed to building on this success in future years in part through the implementation of the ISO-9001 certification. ISO-9001 is an internationally recognized program designed to document and standardize business processes through the use of documented procedures, internal and external audits, and consistent review of product, process, and customer measures at all levels of the organization. AVS earned an organization-wide certificate in October 2006, and continues to maintain that certification through semiannual audits by third-party evaluators.

FY 2009 Program:

AVS consists of eight distinct organizational elements employing 7,184 personnel. Five of these organizations—the Office of Accident Investigation, the Office of Rulemaking, the Aviation Safety Analytical Service Office, the Air Traffic Safety Oversight Service, and the Office of Quality, Integration, and Executive Services—are solely Washington Headquarters elements. The other three – Flight Standards Service, Aircraft Certification Service, and the Office of Aerospace Medicine – have extensive field structures (including some overseas offices).

AVS's eight organizations perform the following activities:

Flight Standards promotes aviation safety and ensures compliance with the operations and maintenance safety standards and certification standards for air carriers, commercial operators, air agencies, airmen, and civil aircraft, including aircraft registration.

Aircraft Certification promotes aviation safety by developing and administering safety standards governing the type, production, and original airworthiness certification of aircraft, engines, propellers, appliances and noise level certification.

Aerospace Medicine promotes aviation safety through medical standards and certification for airmen (pilots and air traffic controllers) and compliance and enforcement of drug and alcohol programs for employees in safety-sensitive positions both in the aviation industry and FAA.

Accident Investigation investigates aviation accidents and incidents to identify unsafe conditions and trends in the National Airspace System (NAS) and coordinates the corrective action process.

Aviation Rulemaking directs and manages FAA's rulemaking program and supports the agency's regulatory priorities.

Aviation Safety Analytical Service provides analytical capabilities based on safety management systems principles and sound safety data analysis and process sharing, incorporating future hazardous/emerging risk assessments affecting the entire air transportation system and industry.

Air Traffic Safety Oversight Service provides safety oversight of ATO, including oversight of safety management systems, new acquisitions, air traffic control procedures and operations, technical operations, and personnel certification criteria.

Quality, Integration, and Executive Services provides overall planning, direction, management, and evaluation of AVS programs. This office also directs and manages the implementation of an ISO-9001:2000 based Quality Management System for all AVS services and offices and establishes integration policy and processes for safety systems.

Because the AVS workforce is small in comparison to the industry and public, we leverage our resources through the designee system. FAA has relied on the designee program since 1927 to help meet our responsibility of ensuring that the aviation industry meets FAA's safety standards. The designee program authorizes private persons and organizations to perform many activities acting on behalf of FAA. The use of designees allows AVS to concentrate on the most critical safety areas, while designees conduct more routine functions. Designees also expand AVS access to technical expertise. AVS currently uses over 11,000 designees, plus another 28,000 people involved in programs such as Flight Check Pilots and Mechanics with Inspection Authority.

Much of AVS workload is demand driven. These workload drivers can be grouped into four general areas: (1) growth in aviation activity, both commercial and general aviation, by existing operators; (2) the introduction of new operators, new aircraft, new equipment, and new technology; (3) the introduction of new practices (e.g., the growth in maintenance outsourcing); and (4) the globalization of the aviation industry and the increasing need for international standardization of regulations and safety criteria.

AVS also faces new challenges in the form of aviation industry growth:

- Increased commercial and general aviation activity;
- Introduction of new entrants into the industry (Unmanned Aerial Systems (UAS) and Very Light Jets (VLJs)); and
- Introduction of new equipment (Airbus 380, Boeing 787), both commercial and general aviation, by existing operators.

The economy is driving this growth:

- Low cost carriers are using new aircraft, equipment, and technologies;
- Legacy carriers are in decline, but need more oversight; and
- The industry has experienced rapid growth in maintenance outsourcing.

Safety is our priority, but our approach must change to meet our challenges. AVS has worked diligently over the years to manage budget constraints and workload demands by streamlining work processes and implementing efficiency measures. Therefore, AVS will ensure that adequate resources (staffing and dollars) remain available to support Continued Operational Safety (AVS top priority) while sequencing and prioritizing some new certification activity.

As the aviation environment and industry changes, we must change with it. The processes and systems that have served us well in the past have done a spectacular job of creating the safest aviation system in the world. To achieve the next level of safety, our traditional methods of diagnosing what went wrong during an accident or incident are not enough – we must analyze trends, data, and systems to tackle issues before they become incidents or accidents.

The FAA, with other federal agencies and operators in the NAS, is adopting a system safety approach to safety management. This approach, called a Safety Management System (SMS), relies on developing standardized language, processes, and tools to manage safety risk. SMS relies on four "pillars":

1. Safety Policy – Aligning procedures and processes in an organization to establish and meet safety objectives;
2. Safety Risk Management (SRM) – Assessing risk in the system to identify and mitigate hazards;
3. Safety Assurance – Continuously monitoring and updating the policies and activities to ensure that the processes work as intended; and
4. Safety Promotion – Creating a safety culture that permeates every area of our work at all levels of the organization.

Implementing an SMS approach is a significant business and cultural change in the way we carry out our safety work. New safety positions require additional skills, such as risk management, systems thinking, evaluation, and analysis.

FY 2009 Accomplishments:

In FY 2009, AVS will continued to improve aviation safety through surveillance, compliance, and, when necessary, enforcement actions. AVS will:

- Reduce the Commercial Air Carrier fatal accident rate to no more than 0.010 accidents per 100,000 departures. (Note: FAA plans to phase out this performance target.)
- Reduce the number of commercial air carrier fatalities to no more than 8.4 per 100 million persons on board.
- Reduce the number of fatal general aviation accidents per 100,000 hours to no more than 1.11.
- Reduce the number of general aviation and part 135 accidents in Alaska to no more than 99.

With regards to specific programs, AVS will:

- Develop an FAA order establishing the requirement and guiding structure for SMS implementation in the agency.
- Develop, flight inspect, and publish at least 50 Required Navigation Performance (RNP) instrument approach procedures.
- Complete implementation of the Air Transport Oversight System (ATOS) to all Part 121 commercial air carriers.
- Develop the capability to monitor known safety threats through the Aviation Safety Information and Analysis System (ASIAS), including increasing the number of databases available and implementing an enterprise architecture. This system accesses and shares information safety data from a variety of systems.
- Track the implementation of 39 CAST safety enhancements that will mitigate specific causal factors of accidents.
- Conduct System Audits of the Air Traffic Organization (ATO) at various facilities.
- Develop and publish guidance for best practice operations for VLJs.
- Publish a directive for experimental airworthiness certification of UAS.
- Develop a general aviation fatality accident rate and target to be used in FY 2009. This will replace the current performance target.
- Perform oversight of the AVS Quality Management System to maintain compliance and retain registration to ISO-9000 quality standards.
- Continue to overhaul our systems safety approach to adequately respond to new requirements being created by explosive industry growth, global expansion, and changing business models for producing and selling aircraft.
- Conduct certifications and surveillance activities including production, airworthiness, air operator, and air agency across the U.S.
- Plan and implement continuity of operations including inspection, surveillance, investigation, and enforcement activities.
- Develop guidance for Aviation Safety Inspectors and Certification Specialists on the Electronic Flight Bag approval process.
- Provide regulatory and technical assistance to international civil aviation authorities.
- Provide technical assistance and FAA/AFS seminars to working groups including China, India, Korea, Mexico, Russia, ICAO Groups, and select regional organizations.
- Provide certification services and support for new operators, agencies, and air carriers through sequencing of applicants.
- Improve oversight of domestic and foreign repair stations, as the repair station industry has grown in both number of repair stations and complexity of the work accomplished.
- Continue implementation of the Cost Accounting System to provide greater insight into the costs of providing specific services.

FY 2010 Budget Request:

For FY 2010, the Assistant Administrator for Aviation Safety requests $1,216,395,000 and 7,116 FTE to meet its mission, an increase of $1.2 million and 102 FTE above the FY 2009 enacted level. This increase provides for basic pay raises and inflation for AVS base programs, as well as an increase of $2,604,000 for

UAS/Drug Inspector Staffing; $480,000 for AVS Analytical Program Staff and $3,720,000 for ASIAS Contract Support.

In FY 2010, AVS will continue to improve aviation safety through surveillance, compliance, and, when necessary, enforcement actions. AVS will:

- Reduce the Commercial Air Carrier fatal accident rate to no more than 0.010 accidents per 100,000 departures. (Note: FAA plans to phase out this performance target.)
- Reduce the number of commercial air carrier fatalities to no more than 8.2 per 100 million persons on board.
- Reduce the number of fatal general aviation accidents per 100,000 hours to no more than 1.10.
- Reduce the number of general aviation and part 135 accidents in Alaska to no more than 99. This measure is being converted into a rate in FY 2010 (TBD).

With regards to specific programs, AVS will:

- Track the implementation of 39 CAST safety enhancements that will mitigate specific causal factors of accidents.
- Implement a joint information data sharing plan to aggregate and combine safety data from CAST, VASIS, and NextGen programs.
- Finalize a National Integrated Strategic Safety Plan across multiple government agencies to implement SMS and submit the plan to the Joint Planning and Development Office (JPDO).
- Conduct System Audits of ATO involving ten percent of ATO facilities.
- Create an AVS delegation management system and migrate designee data from current systems into this system.
- Continue to enable the introduction of a new generation of VLJs designed to revolutionize air travel.
- Continue to expand the introduction of civil UAS into the NAS to support national security, defense and public need for this technology, and the U.S industry's economic interests.
- Continued deployment of precision navigation through RNP procedures by supporting new approaches each year.
- Perform oversight of the AVS Quality Management System to maintain compliance and retain registration to ISO-9000 quality standards.
- Continue to implement the GA Joint Steering Committee initiatives.
- Provide the JPDO Integrated Product Teams (IPT) with a means to evaluate the effect of proposed changes on the safety of NextGen.
- Continue to overhaul our systems safety approach to adequately respond to new requirements being created by explosive industry growth, global expansion, and changing business models for producing and selling aircraft.
- Conduct certifications and surveillance activities including production, airworthiness, air operator and air agency across the U.S.
- Plan and implement continuity of operations including inspection, surveillance, investigation, and enforcement activities.
- Provide regulatory and technical assistance to international civil aviation authorities.
- Provide technical assistance and FAA/AFS seminars to working groups including China, India, Korea, Mexico, Russia, ICAO Groups, and select regional organizations.
- Provide certification services and support for new operators, agencies, and air carriers.
- Improve oversight of domestic and foreign repair stations, as the repair station industry has grown in both number of repair stations and complexity of the work accomplished.

Explanation of Funding Changes for Aviation Safety (AVS)

	Dollars ($000)	FTE
Aviation Safety (Net Change from FY 2009 Enacted)	**$51,798**	**95**
Overview: For FY 2010, the Associate Administrator for Aviation Safety (AVS) requests $1,216,395,000 and 7,116 FTE to meet its mission of promoting aviation safety in the interest of the American public and the millions of people who rely on the aviation industry for business, pleasure, and commerce. The FY 2010 request level reflects unavoidable pay raises and inflation; staffing increases for aircraft certification staff, drug inspectors, and safety program analysis staff and six FAA base transfers. The FY 2010 FTE request level consists of annualization of 83 FTE hired in FY 2009; and an increase of 36 (18 FTE) safety staff.		
Unavoidable Adjustments		
Annualized FTE: This represents the net annualized costs of FY 2009 new hires and attrition.	13,156	83
Annualized FY 2009 Pay Raise (GS Population): This pay raise has been calculated separately based on the employee population still under the General Schedule. This increase is needed to provide for the full-year cost associated with the 3.9 percent average government-wide pay raise in January 2009. The actual factor used is 4.8 (3.9 percent plus 0.9 percent average of Within-Grade increases). The FY 2009 portion of this pay raise will be absorbed within enacted amounts; this increase covers the first quarter of FY 2009.	5,283	
Annualized FY 2009 Pay Raise (Core Comp Population): This pay raise has been calculated separately based on the employee population under the Core Compensation pay plan. This increase is needed to provide for the full-year cost associated with the Organizational Success Increase (OSI) and the Superior Contribution Increase (SCI) awarded in FY 2009. The OSI is 100 percent of the 3.9 percent average government-wide pay raise plus 1.0 percent (4.9 percent). The Core Compensation system awards three different pay raises—20 percent of the population receive the OSI plus a 1.8 percent SCI, 45 percent receive the OSI plus a 0.6 percent SCI, and 35 percent receive just the OSI. The FY 2009 portion of this pay raise will be absorbed within enacted amounts; this increase covers the first quarter of FY 2010.	4,144	
FY 2010 Pay Raise (GS Population): This pay raise has been calculated separately based on the employee population under the General Schedule. This increase is required to provide for costs associated with base salary increases. The factor used is 2.9 percent, composed of the projected 2.0 percent government-wide	12,096	

	Dollars ($000)	FTE
pay raise in January 2010 plus 0.9 percent average of Within-Grade increases.		
FY 2010 Organizational Success Increase (OSI) (Core Comp Population): This pay raise has been calculated separately based on the employee population under the Core Compensation pay plan. This increase is required to provide for costs associated with base salary increases that are provided to employees meeting or exceeding job expectations. The factor used is 3.0 percent, composed of the projected 2.0 percent government-wide pay raise in January 2010 plus 1.0 percent for the full OSI increase (derived from the elimination of Within-Grade increases). A fundamental component of the FAA's pay-for-performance system, this increase assumes FAA will meet most of its FY 2009 performance goals.	8,234	
FY 2010 Superior Contribution Increase (SCI): This increase is required to provide for costs associated with base salary increases that are provided to employees in the Core Compensation system providing superior contributions to the organization. The factor used is 1.8 percent for 20 percent of the population and 0.6 percent for 45 percent of the population. The remaining 35 percent do not receive this increase.	1,729	
Non-Pay Inflation: This increase is needed to provide for inflationary cost increases consistent with OMB guidance that uses the FY 2010 GDP price index (year over year) of 0.5 percent.	1,196	
Discretionary Increases		
Aviation Safety (AVS), UAS and drug inspector Staffing Increase: The funding will enable AVS to hire and train 30 aviation safety personnel (15 FTE). This staff increase will consist of approximately fifteen engineers, six Alcohol/Drug Abatement Inspectors and nine safety/operational program staffers who will provide additional oversight and surveillance services. An increase in Aviation Safety staffing is required to satisfy increased government and industry demand for Unmanned Aircraft Systems (UAS) access to the National Airspace System (NAS). The positions will develop airworthiness requirements and expedite the airworthiness approval process for UAS. The demand for UAS government/industry access include: DOD mission training, DHS border/port patrol and off-shore surveillance, Department of Commerce environmental and atmospheric monitoring/surveillance and other emerging commercial and public-use applications for agricultural, pipeline, and maritime monitoring/surveillance, as well as aerial surveying and photography.	2,604	15

	Dollars ($000)	FTE
An additional six alcohol/drug inspectors will increase the number of regulatory compliance inspections at aviation industry employers. At the end of FY 2008, the program had only 62 inspectors and investigators to oversee approximately 7,000 companies. The additional positions will enable alcohol/drug inspections to grow by 10 percent annually.		
AVS Analytical Staffing Increases: The funding will enable AVS to hire and train six safety critical positions (3 FTE) within the Aviation Safety Analytical Service (ASA). The additional staff positions will perform analysis of emerging risk, future hazards, and trends within the National Airspace System (NAS).	480	3
ASIAS Contract Support: The funding will enable AVS to obtain contract support for the Aviation Safety Information and Analysis Sharing (ASIAS) system, a cross-cutting risk management system to ensure safety improvements during the NextGen transition. The contractors will provide support for the establishment of network telecommunications that will connect ASIAS with the airline nodes. The request will allow contract personnel to provide technical and project support for ASIAS, and provide funding for the expansion and maintenance of automation systems that support ASIAS through the advancement of telecommunication capabilities.	3,720	
Base Transfers		
Labor Relations Improvements: In FY 2006, FAA reallocated labor relations positions in each of our regional offices under the Assistant Administrator for Human Resources. This was part of a multi-phased effort to move toward a more corporate and consistent approach in carrying out labor relations responsibilities in a multi-union environment. In continuation of this effort, the Office of Aviation Safety will transfer $158,000 and one FTE to the Assistant Administrator for Human Resources in support of this labor relations goal.	-158	-1
Office of Audit and Evaluation: The FAA established the Office of Audit and Evaluation to oversee safety-related issues. Currently, FAA has several different programs and entry points for disclosures and recommendations on safety-related and personnel issues, including whistleblower issues. Establishment of this organization will centralize this safety-related oversight function. To establish this organization, the Offices of the Administrator, Associate Administrator for Aviation Safety, and Assistant Administrator for Financial Services will transfer $1,422,000 and 11 FTE to the Office of the General Counsel.	-693	-6
Views:	-149	

	Dollars ($000)	FTE
The FAA's Strategic and Business Planning efforts are now fully incorporated into the agency's management process. In order to manage the FAA's Strategic and Business Planning program, all Operations-funded Lines of Business and Staff Offices are transferring funds totaling $1,197,000 to the Office of Aviation Policy, Planning, and Environment in support of this agency-wide effort.		
Clinical Psychologist: As the air traffic controller hiring process continues, many of the original screening processes are being upgraded, including the initial applicant psychological testing. The current psychological test, the 16PF, is being replaced with the Minnesota Multiphasic Personality Inventory-2 (MMPI-2). To facilitate this effort, the Office of Aerospace Medicine (AAM), the responsible organization for incoming testing, is hiring a licensed clinical psychologist. The ATO will transfer $156,000 and one FTE in support of the controller hiring effort.	156	1

AVS Primary Customer Base
(General Public is our Ultimate Customer)

Air Operator Certificates: 6,110
116 Major Air Carriers -- (e.g. United Airlines)
2,350 Commuter Air Carriers/On Demand Air Taxis
161 Commercial Operators (e.g. Baltimore Orioles)
454 Foreign Air Carriers (e.g. Lufthansa)
331 External Load (Logging/Oil Platform)
2,189 Agricultural Operators
509 Public Use Authorities (State/City/Police)

Air Agency Certificates: 5,803
554 Pilot Training Schools
4,957 Repair Stations
171 Maintenance Training Schools
121 Pilot Training Centers

Aircraft: 319,549
7,705 Air Carrier Aircraft
576 Commuter Air Carrier Aircraft
12,504 On Demand Air Taxi Aircraft
207,087 General Aviation Aircraft
91,677 Inactive Aircraft

Aviation Authorities - other countries
30 Bilateral Agreements
105 Foreign Carrier Aviation Authorities
188 Accident Investigation Authorities

Check Airmen: 7,592
5,590 Part 121
201 Parts 121/135
1,801 Part 135

Designees: 11,095
4,656 Aircraft Certification
1,444 Flight Standards
4,995 Aerospace Medicine

Mechanics with Inspection Authority: 20,458

Active Pilots: 747,775
149,951 ATP
139,766 Commercial
242,597 Private
260 Recreational
2,557 Sport
85,663 Student
126,981 Foreign Pilot

Non-Pilot Air Personnel: 721,400
368,548 Mechanics & repairmen
41,948 Control Tower Operator
154,440 Flight Attendant
74,997 ground instructors
81,847 other (dispatchers/flight navigators/ parachute riggers/flight engineers)

Flight Instructors: 93,612

Airmen Medical Examinations: 438,699
16,100 Special Issuances

Approved Manufacturers: 1,647

Aviation Industry Entities Covered by Anti-Drug & Alcohol Programs: 7,200

National Transportation Safety Board
75 Safety Recommendations (5-year average)
30 Major Investigations (avg/yr)(new)

ATCS Medical Clearance Exams: 20,347
17,598 Air Traffic Controller Workforce
2,749 Flight Service Station Workforcce

Occupational/Employee Health Services
48,853 FAA Employees

As of April 1, 2009

Resource Summary

AVS

	FY 2008 Actual [1]	FY 2009 Enacted	Unavoidable Changes	Discretionary Changes	FY 2010 Request
Funding ($000)					
PC&B	851,405	925,492	34,982	3,084	963,558
Other Objects					
Travel/Transportation	60,026	59,125	5,300	-	64,425
Other Services	149,683	154,972	730	3,720	159,422
RCU [2]	5,720	7,600	825	-	8,425
Other [3]	20,060	17,408	3,157	-	20,565
Total	235,490	239,105	10,012	3,720	252,837
Total	**1,086,895**	**1,164,597**	**44,994**	**6,804**	**1,216,395**
Staffing					
EOY (FTP)	7,002	7,184	(6)	36	7,214
OTFTP	101	110	-	-	110
Total FTEs (Includes FTP and OTFTP)	6,923	7,021	77	18	7,116

[1] FY 2008 derived from actual obligations.

[2] Rents, Communications, Utilities.

[3] Printing & Reproduction Services, Supplies & Materials, Equipment, Land & Structures, and Insurance Claims & Indemnities.

Resource Summary
($ in Thousand)

		FY 2007 Actual	FY 2008 Actual	FY 2009 Enacted	FY 2010 Change	FY 2010 Request
Flight Standards	PC&B	567,997	595,357	636,513	28,012	664,525
	O.O.	127,580	129,046	144,611	1,623	146,234
	Total	695,577	724,403	781,124	29,635	810,759
Aircraft Certification	PC&B	150,852	157,733	167,740	9,881	177,621
	O.O.	21,763	21,823	23,689	474	24,163
	Total	172,615	179,556	191,429	10,355	201,784
Aerospace Medicine	PC&B	34,189	36,721	39,762	2,160	41,922
	O.O.	9,241	9,695	10,401	130	10,531
	Total	43,430	46,416	50,162	2,290	52,452
Accident Investigation	PC&B	4,205	4,470	5,232	183	5,415
	O.O.	1,828	2,037	2,234	45	2,279
	Total	6,033	6,507	7,466	228	7,693
Rulemaking	PC&B	3,059	3,322	3,975	139	4,114
	O.O.	962	984	1,165	23	1,189
	Total	4,021	4,306	5,140	162	5,303
Air Traffic Safety Oversight	PC&B	7,266	8,284	16,649	2,819	19,467
	O.O.	1,940	2,422	2,415	48	2,463
	Total	9,206	10,705	19,064	2,867	21,931
Aviation Safety Analysis*	PC&B	0	2,652	3,899	936	4,835
	O.O.	0	3,416	3,081	3,431	6,512
	Total	0	6,068	6,980	4,367	11,347
Suspected Unapproved Parts**	PC&B	1,454	0	0	0	0
	O.O.	172	0	0	0	0
	Total	1,626	0	0	0	0
Quality, Integration, and Executive Services***	PC&B	16,073	35,882	38,592	1,265	39,857
	O.O.	58,479	67,757	64,641	629	65,269
	Total	74,552	103,639	103,232	1,894	105,126
Total, Aviation Safety ****	PC&B	785,095	844,422	912,360	45,395	957,756
	O.O.	221,965	237,180	252,237	6,403	258,639
	Total	1,007,060	1,081,602	1,164,597	51,798	1,216,395

As of April 1, 2009

* Includes creation of Aviation Safety Analysis Service
** Includes closing of Suspected Unapproved Parts office
*** Includes information technology employee transfer from AFS, AIR, and AAM to AQS
****The FY 2008 total Aviation Safety numbers do not tie to the table on page 64 due to reimbursable funding is not included.

Safety Critical/Operational Support Staffing (End-of-Year Employment - FTP)

	FY 2007 Actual	FY 2008 Actual	FY 2009 Enacted	FY 2010 Change	FY 2010 Request
Flight Standards					
Aviation Safety Inspectors	3,780	3,900	4,005	0	4,005
Safety Technical Specialist	421	420	415	0	415
Operational Support****	624	662	634	-1	633
Total	4,825	4,982	5,054	-1	5,053
Aircraft Certification					
Manufacturing Safety Inspectors	221	222	240	0	240
Pilots, Engineers, and CSTAs	668	686	709	15	724
Safety Technical Specialist	152	174	170	3	173
Operational Support	138	133	142	2	144
Total	1,179	1,215	1,261	20	1,281
Aviation Medicine					
Physicians, Physician Assistants, Nurses	58	56	55	0	55
Alcohol/Drug Abatement Inspectors	70	80	62	6	68
Safety Technical Specialist	130	160	203	4	207
Operational Support****	64	65	38	1	39
Total	322	361	358	10	369
Accident Investigation					
Air Safety Investigators	10	10	10	0	10
Safety Technical Specialist	17	19	19	0	19
Operational Support	4	5	6	-5	1
Total	31	34	35	0	30
Air Traffic Safety Oversight					
AOV Safety Inspectors	3	0	0	0	0
Air Traffic Controllers	20	28	43	0	43
Safety Technical Specialist	35	54	82	0	82
Operational Support	2	3	8	0	8
Total	60	85	133	0	133
Rulemaking					
Safety Technical Specialist	27	25	29	0	29
Operational Support	3	3	3	0	3
Total	30	28	32	0	32
Aviation Safety Analysis*					
Safety Technical Specialist	9	17	20	5	25
Operational Support	2	3	6	1	7
Total	11	20	26	6	32
Suspected Unapproved Parts**					
Aviation Safety Inspectors	0	0	0	0	0
Safety Technical Specialist	0	0	0	0	0
Operational Support	0	0	0	0	0
Total	0	0	0	0	0
Quality, Integration, and Executive Services***					
Safety Critical Staff	129	123	127	0	127
Operational Support****	151	154	158	-1	157
Total	280	277	285	-1	284
Totals					
Safety Critical Staff	5,750	5,974	6,189	33	6,222
Operational Support	988	1,028	995	-3	992
Total	6,738	7,002	7,184	30	7,214

As of April 1, 2009

* Includes creation of Aviation Safety Analysis Service
** Includes closing of Suspected Unapproved Parts office
*** Includes base transfers of positions from/to other non-AVS organizations

Staffing Information

Direct FTEs	FY 2007 Actual	FY 2008 Actual	FY 2009 Enacted	Proposed Change	FY 2010 Request
Flight Standards	4,780	4,927	4,967	45	5,012
Aircraft Certification	1,160	1,205	1,233	28	1,261
Medical	318	354	354	5	359
Accident Investigation	27	30	32	(1)	31
Rulemaking	28	27	27	0	27
Air Traffic Safety Oversight	52	75	104	15	119
Aviation Safety Analysis*	12	16	23	3	26
Quality, Integration, and Executive Services***	270	278	281	0	281
Total	6,647	6,912	7,021	95	7,116

End-of-Year Employment (FTP)	FY 2007 Actual	FY 2008 Actual	FY 2009 Enacted	Proposed Change***	FY 2010 Request
Flight Standards	4,825	4,982	5,054	(1)	5,053
Aircraft Certification	1,179	1,215	1,261	20	1,281
Medical	322	361	358	11	369
Accident Investigation	31	34	35	(5)	30
Rulemaking	30	28	32	0	32
Air Traffic Safety Oversight	60	85	133	0	133
Aviation Safety Analysis*	11	20	26	6	32
Quality, Integration, and Executive Services***	280	277	285	(1)	284
Total	6,738	7,002	7,184	30	7,214

As of April 1, 2009

* Includes creation of Aviation Safety Analysis Service
** Includes information technology employee transfer from AFS, AIR, and AAM to AQS
*** Includes base transfers of positions from/to other non-AVS organizations

Workload Indicators

Flight Standards

Workload	FY 2007 Actual	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
Airmen Certification Activities	245,809	255,879	263,358	265,992
Operator Certification/Certificate Management Activities	94,614	97,323	92,710	93,637
Investigation Activities	34,981	33,214	33,184	33,848
Non-ATOS Air Operator/Air Agency Surveillance Activities*	241,927	186,383	191,237	194,106
ATOS Operator Surveillance Activities	42,536	78,700	82,146	82,967
Enforcement Investigation Activities	11,039	10,934	10,496	10,601
Education & Safety	32,448	35,922	23,348	23,698
Aircraft Registration Examinations	235,219	218,651	222,149	255,744
Airmen Certification Examinations	226,237	384,570	396,107	407,990

Percent Change	FY06 - FY07 Actual	FY07 - FY08 Actual	FY08 - FY09 Estimate	FY09 - FY10 Estimate
Airmen Certification Activities	-1.1%	4.1%	2.9%	1.0%
Operator Certification/Certificate Management Activities	4.9%	2.9%	-4.7%	1.0%
Investigation Activities	7.2%	-5.1%	-0.1%	2.0%
Non-ATOS Air Operator/Air Agency Surveillance Activities*	-27.4%	-23.0%	2.6%	1.5%
ATOS Operator Surveillance Activities	21.2%	85.0%	4.4%	1.0%
Enforcement Investigation Activities	4.3%	-1.0%	-4.0%	1.0%
Education & Safety	-39.5%	10.7%	-35.0%	1.5%
Aircraft Registration Examinations	9.7%	-7.0%	1.6%	15.1%
Airmen Certification Examinations	2.9%	70.0%	3.0%	3.0%

* Includes other than Part 121 carriers

Aircraft Certification

Workload	FY 2007 Actual	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
Certificated Aircraft Types in Operation	1,012	1,014	1,016	1,025
Airworthiness Directives Issued (NPRM through final rule)	177	180	185	190
Active Representatives of the Administrator	6,183	6,190	6,200	6,200
Inspections/Audits	3,035	4,000	4,100	4,150
New Certifications, Approval, & Appointments	10,233	10,250	10,300	10,500

Percent Change	FY06 - FY07 Actual	FY07 - FY08 Actual	FY08 - FY09 Estimate	FY09 - FY10 Estimate
Certificated Aircraft Types in Operation	0.4%	0.2%	0.2%	0.9%
Airworthiness Directives Issued	-57.2%	1.7%	2.8%	2.7%
Active Representatives of the Administrator	27.5%	0.1%	0.2%	0.0%
Inspections/Audits	-53.3%	31.8%	2.5%	1.2%
New Certifications, Approval, & Appointments	-6.2%	0.2%	0.5%	1.9%

Workload Indicators (cont.)

Aerospace Medicine

Workload	FY 2007 Actuals	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
Applications Processed/Received	438,644	444,439	450,292	450,292
DWI/NDR Applications Processed	13,856	13,995	14,135	14,135
Number of AMEs	4,194	4,200	4,100	4,100
Anti-Drug and Alcohol Registrations Completed	321	330	340	355
Anti-Drug and Alcohol MIS Annual Reports	1,365	1,900	2,500	2,550
Compliance and Enforcement Inspections	1,236	1,525	1,750	1,900
Number of Drug Tests	11,125	11,500	11,500	11,500
Number of Alcohol Tests	3,351	3,500	3,500	3,500

Percent Change	FY06 - FY07 Actual	FY07 - FY08 Actual	FY08 - FY09 Estimate	FY09 - FY10 Estimate
Applications Processed/Received	-23.0%	1.3%	1.3%	0.0%
DWI/NDR Applications Processed	22.1%	1.0%	1.0%	0.0%
Number of AMEs	-10.9%	0.1%	-2.4%	0.0%
Anti-Drug and Alcohol Registrations Completed	-8.3%	2.8%	3.0%	4.4%
Anti-Drug and Alcohol MIS Annual Reports	4.2%	39.2%	31.6%	2.0%
Compliance and Enforcement Inspections	-16.1%	23.4%	14.8%	8.6%
Number of Drug Tests	51.1%	3.4%	0.0%	0.0%
Number of Alcohol Tests	18.5%	4.4%	0.0%	0.0%

Accident Investigation

Workload	FY 2007 Actuals	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
NTSB Recommendations Received	72	70	75	75
Accidents/Incidents Investigated	44	46	47	48
Follow-Up Investigations	175	175	170	170
Special Accidents/Incidents Investigations	100	110	110	110
NTSB Hearings Participated In	2	2	4	4
FAA Recommendations Received	207	250	315	315
NTSB Requests Received	164	179	130	130

Percent Change	FY06 - FY07 Actual	FY07 - FY08 Actual	FY08 - FY09 Estimate	FY09 - FY10 Estimate
NTSB Recommendations Received	-1.4%	-2.8%	7.1%	0.0%
Accidents/Incidents Investigated	-13.7%	4.5%	2.2%	2.1%
Follow-Up Investigations	12.9%	0.0%	-2.9%	0.0%
Special Accidents/Incidents Investigations	7.5%	10.0%	0.0%	0.0%
NTSB Hearings Participated In	0.0%	0.0%	100.0%	0.0%
FAA Recommendations Received	-27.9%	20.8%	26.0%	0.0%
NTSB Requests Received	23.3%	9.1%	-27.4%	0.0%

Workload Indicators (cont.)

Rulemaking

Workload	FY 2007 Actuals	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
Exemptions	839	417	550	550
Petitions for Rulemaking	15	20	20	20
Rulemaking Projects	29	36	35	35
Aviation Rulemaking Advisory Committee:				
Tasks	2	3	3	3
Recommendations	3	3	3	3

Percent Change	FY06 - FY07 Actual	FY07 - FY08 Actual	FY08 - FY09 Estimate	FY09 - FY10 Estimate
Exemptions	63.9%	-50.3%	31.9%	0.0%
Petitions for Rulemaking	-21.1%	33.3%	0.0%	0.0%
Rulemaking Projects	-21.6%	24.1%	-2.8%	0.0%
Aviation Rulemaking Advisory Committee:				
Tasks	-50.0%	50.0%	0.0%	0.0%
Recommendations	-25.0%	0.0%	0.0%	0.0%

Suspected Unapproved Parts

Workload	FY 2007 Actual
Cases Opened	230
Cased Closed	208
Reports Received	273

Percent Change	FY06 - FY07 Actual
Cases Opened	-3.8%
Cased Closed	11.8%
Reports Received	-2.5%

Air Traffic Safety Oversight

Workload	FY 2007 Actuals	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
Safety Analysis and Audits	14,148	32,458	49,690	64,163
Safety Incident Investigations	11,936	25,990	47,590	61,451
Air Traffic Change Approvals	2,422	11,642	21,270	27,465
Safety Report Reviews	6,829	17,408	18,884	24,384
Airmen Credentialing/Examination	8,040	18,683	16,234	16,234
Education and Safety	25,662	40,149	43,159	55,730

Percent Change	FY06 - FY07 Actual	FY07 - FY08 Actual	FY08 - FY09 Estimate	FY09 - FY10 Estimate
Safety Analysis and Audits	81.6%	129.4%	53.1%	29.1%
Safety Incident Investigations	50.1%	117.7%	83.1%	29.1%
Air Traffic Change Approvals	-34.8%	380.7%	82.7%	29.1%
Safety Report Reviews	116.9%	154.9%	8.5%	29.1%
Airmen Credentialing/Examination	233.9%	132.4%	-13.1%	0.0%
Education and Safety	240.5%	56.5%	7.5%	29.1%

OPERATIONS APPROPRIATION

Commercial Space (AST)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2009 Enacted (Omnibus)	**14,094**	**71**	**1**	**68**
FY 2009 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	270			2
2. Annualized FY 2009 Pay Raise (GS Population)	10			
3. Annualized FY 2009 Pay Raise (Core Comp Population)	94			
4. January 2010 Pay Raise (GS Population)	22			
5. January 2010 OSI (Core Comp Population)	186			
6. January 2010 SCI	39			
7. Non-pay inflation	24			
8. GSA Rent Increase	0			
Total Unavoidable Adjustments	**645**	**0**	**0**	**2**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. DOL Wage Determination Increases	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. Air Traffic Controller Hiring	0			
2. NextGen Staffing Increase	0			
3. UAS / Drug Inspector Staffing	0			
4. AVS Analytical Program Staff	0			
5. ASIAS Contract Support	0			
6. NextGen Environmental/Noise	0			
7. Congestion Studies	0			
8. National Security Systems Classified/ Controlled Information	0			
9. National Security Coordination Division/ Counter Intelligence	0			
10. Equal Employment Opportunity (EEO) and Civil Rights Programs	0			
11. FAA Privacy Program	0			
12. Automated Staffing and Processing (ASAP)	0			
13. Financial Systems Upgrades	0			
Total Discretionary Increases	**0**	**0**	**0**	**0**
Cost Efficiencies				
1. Rents, Utilities, and Leases	0			
2. Service Center Business Process Reengineering	0			
3. Administrative Overhead Efficiencies	0			
Total Cost Efficiencies	**0**	**0**	**0**	**0**
Base Transfers				
1. Air Traffic Controller Hiring Support	0			
2. Automated Staffing and Application Process (ASAP) System Enhancements	0			
3. Labor Relations Improvements	0			
4. Technical Library	0			
5. Office of Audit and Evaluation	0			
6. Panorama Business Views (PB Views)	-2			
7. Tech Ops Hiring	0			
8. Litigation Support	0			
9. Emergency Communications	0			
10. FAA Historian	0			
11. Clinical Psychologist	0			
12. Acquisition Support (AMQ) to Franchise Fund	0			
Total Base Transfers	**-2**	**0**	**0**	**0**
FY 2010 Request	**14,737**	**71**	**1**	**70**

Detailed Justification for Commercial Space Transportation (AST)

Commercial Space Transportation	FY 2010 Request: $14,737

Overview:

The Associate Administrator for Commercial Space Transportation (AST) is committed to a timely and responsive licensing and regulatory process designed to enable a safe, secure, efficient, and internationally competitive U.S. space transportation industry.

Goals:

- No fatalities, serious injuries, or significant property damage to the uninvolved public during licensed or permitted space launch and reentry activities.
- Encourage, facilitate and promote the growth of commercial space transportation through environmental activities and delivery of products that will improve the international competitiveness of the U.S. commercial space transportation industry.
- Maintain a leadership role within the international commercial space transportation community by participating in international forums to raise awareness of safety oversight best-practices and activities.
- Manage for results that support achievement of AST's mission and vision.
- AST's goals will be supported by:
  - Regulating commercial space launches, reentries, and operations of launch and reentry sites.
  - Implementing the National Space Transportation Policy.
  - Promoting development of new or improved U.S. commercial space launch vehicle technology.
  - Encouraging public-private partnerships to construct new or improved infrastructure to accommodate increasing demand for commercial space launches.
  - Supporting development and monitoring of agreements to advance fair and equitable international trade in space launches.
  - Analyzing and assessing market trends and forces that impact the international competitiveness of the U.S. industry.
  - Controlling costs, improving customer service, managing resources effectively and efficiently, and carrying out a comprehensive training plan to meet the unique needs of AST's commercial space transportation technical professionals.

FY 2009 Program:

The mission of the Office of Commercial Space Transportation is to ensure public safety during commercial launch and reentry activities, and to encourage, facilitate, and promote U.S. commercial space transportation.

Safety is AST's top priority. AST's core business function is to protect uninvolved public, property and the national security and foreign policy interests of the United States from the dangers associated with commercial space launch and reentry operations. These functions include approving license and permit applications, inspecting licensed and permitted operations, and developing rulemaking products related to commercial launch and reentry activities.

AST's processes evolve with the commercial space transportation industry, ensuring public safety. With a focus on the rapid evolution and complexity of new launch vehicles and associated technologies, AST will lead agency efforts to evaluate safety critical launch and reentry vehicle components, systems, and operations. Further, AST will continue to improve its processes and leverage partnerships with other government organizations to improve the safety of launches and reentries occurring from both federal and non-federal launch sites.

Planning for human space flight has surged since Scaled Composites won the Ansari X Prize with SpaceShipOne. The initial regulatory regimes for human space flight and experimental permits were established in FY 2007, and development continues. Several companies have conducted test flights under the experimental permit regime and are planning to provide space flight with a crew within the 2010 to 2011 timeframe. In October 2008, the X Prize Foundation sponsored its third X Prize Cup competition at which Armadillo Aerospace won the first level competition, garnering a $350K NASA-sponsored prize. This annual event gathers many companies and/or teams to compete in space-related events, several of which require the competitors to have licenses or experimental permits for their vehicle operations. AST works with the X Prize Foundation through a new form of industry partnership that promotes communication, with AST receiving information about planned events and assessing their safety impact. Through the X Prize Foundation, AST is better able to ensure participants are cognizant of regulatory requirements. AST is conducting independent flight safety analyses and safety evaluations of proposed activities for future X Prize Cup events. Some of the X Prize Cup events do not require a launch license or permit, such as amateur rocket launches. However, due to the Lunar Lander Challenge issued by NASA in FY 2006, several applications for permitted flights are in various stages of the evaluation process. In addition, in August 2006 NASA awarded Space Act Agreements under what is referred to as the COTS (Commercial Orbital Transportation Services) program to resupply and return cargo and crew to and from the International Space Station. The COTS program has provided AST with its first opportunity to exercise the reentry regulations promulgated in 2000, and to make reentry determination. NASA awarded Commercial Resupply Services (CRS) contracts to two commercial launch providers, SpaceX and Orbital Sciences Corporation, in December 2008. The ensuing 20 CRS launches will require FAA licensing.

As well as ensuring public safety, AST enables industry through various activities intended to encourage and promote the growth of U.S. commercial space transportation. AST's core business functions in this area include performing environmental projects, publishing reports on industry developments and trends, hosting stakeholder forums, and supporting development of policies that impact the U.S. commercial space launch industry.

AST is committed to working with its stakeholders to identify approaches that will provide greater service and satisfaction, as well as cost savings.

FY 2009 Accomplishments:

AST currently has 18 active licenses: 12 for launching expendable launch vehicles (ELVs) and six for operating launch sites; and three active permits. AST continues to streamline the environmental review process in its licensing and permitting efforts. Based on the increase in commercial space transportation since the Commercial Space Launch Amendments Act of 2004, AST work with Reusable Launch Vehicles (RLV) operators continues to increase in FY 2009. This increased workload begins in the preapplication phase and continues through the environmental assessment, the air traffic evaluation, and the development of memorandums of agreement to aid new operators. In addition, companies taking part in NASA's COTS demonstrations, requiring launch licenses or permits, are at various stages of flight readiness.

Several companies are planning to offer space flight to the public within the FY 2010 to 2011 timeframe, adding a complicating dimension to permit and license evaluations.

As a follow-up to the license and permit process, AST will conduct safety inspections to ensure adherence to the regulatory requirements. AST conducts at least one annual inspection at each commercial launch site and, at a minimum, an inspection of launch operations at the time of flight. Currently, there are six licensed launch site operators and AST will conduct six site inspections. In addition to inspections of launch operations at the time of flight, AST may conduct inspections before and after the time of flight, verifying launch preparation and post-flight events. The number of expendable launch vehicle (ELV) launches and inspections should remain the same as FY 2008. RLV launches, however, are difficult to predict accurately. By FY 2009 we expect only a few will be conducted under licenses, but many will be under experimental permits as RLV vehicles and operations continue to undergo testing, training, and research and development. Estimates for RLV launches range from 25 to 40 and higher. The FAA expects to conduct five inspections of permitted launch operations in FY 2009.

AST will carry out regulatory development projects such as Explosive Siting, trajectory dispersion methodology for piloted RLVs, and GPS Users Guide for RLV Navigation and Tracking.

AST will continue collaborating with DoD and NASA through the Common Standards Working Group to maintain common launch safety requirements and to aid DoD's understanding of commercial space entrepreneurial capabilities. AST will continue its collaboration with NASA on the COTS initiative.

AST's research supports development of safety regulations and standards to keep pace with a growing space industry. Each year AST makes a call for new research projects, to be accomplished during the following fiscal year, to the Commercial Space Transportation Advisory Committee (COMSTAC) and RLV and Launch Operations Support Working Groups. COMSTAC members are senior executives from the U.S. commercial space transportation industry, including entrepreneurial firms as well as large aerospace companies; the satellite industry; space-related state government officials; academia; and representatives from space advocacy organizations. AST receives 12-15 project ideas each year and determines if they support its safety and promotion goals. The suggested projects are ranked by likelihood of a successful outcome with topics that may soon be useful in new safety practices. Projects often include reviewing current modeling techniques, determining the current state of technological developments, and evaluating alternative safety methods that may be proposed by the industry. The most promising two to three projects, depending on estimated cost, are pursued.

AST continues to develop the requirements for Phase 1 of the first automated SATMS DST application. The tool supports launch and reentry mission planning. SATMS represents a conceptual "aerospace" environment in which space and aviation operations are seamless and fully integrated in a modernized, efficient NAS. Demand for access to the nation's airspace by aviation users (civil, military, and general) continues to increase. As a result, the need to improve the safety and efficiency of tools and processes is paramount to the SATMS vision. The SATMS DST will identify space vehicle airspace requirements, plan air traffic reroutes, and enables space vehicles to be tracked through the NAS. Phase 2 of the development began in FY 2009 and will include an evaluation of the initial draft requirements.

AST will publish an Industry Developments and Concepts Report, a Commercial Space Transportation Forecast, and four quarterly launch reports to provide information about significant changes in commercial space transportation. In developing forecasts, year-in-review documents and special topic reports, AST gathers information, evaluates the sources of the data, and analyzes and displays the information clearly to inform both the public and industry. These reports are used by industry to measure its performance in the commercial market, by state governments to influence development of new space launch activities, and by the DoD and NASA as they review launch requirements. AST also conducts a public Space Transportation Conference with an agenda based on industry and government feedback.

AST reaches out to students, teachers, and academic administrators with its Education Initiative. This program develops knowledge of the commercial space transportation industry and its career potentials, as well as increase interest in science, math, and engineering. Also, AST will participate in local school career days and educational conferences and develop educational materials for publication and the AST website.

AST designs its Organizational Excellence activities to help it meet the challenges of its primary mission – protect the public, property, and national security and foreign policy interests of the United States – efficiently and effectively. AST seeks to improve its organizational performance in three areas: human resource management, fiscal resource management, and training. AST supports the agency's lead in strategic management areas, including the early dispute resolution system, workforce planning, and performance planning. AST's efforts toward organizational excellence also help it be a responsible steward of public funds. AST will expand its efforts to obtain a broader range of customer feedback in FY 2009 and will continue its scrutiny of budget requirements and spending in its cost control effort.

AST will continue to strengthen the knowledge of its technical and professional staff in areas unique to space transportation. It will use a mix of commercial, government, and internally developed courses to provide at least 1,800 student-hours of professional development and technical training for AST staff.

FY 2010 Budget Request:

For FY 2010, the Associate Administrator for Commercial Space Transportation requires $14,737,000 and 70 FTEs to meet its mission. This is an increase of $643,000 (4.5 percent) and annualizes two FTE (3.0 percent) from FY 2009. This increase will provide for pay raise and inflation.

For FY 2010, FAA/AST projects to have at least seven customers in some phase of either the license determination or experimental permitting process. AST will continue its efforts to streamline the environmental review process in its licensing and permitting efforts. Based on the increase in commercial space transportation activity since FY 2004 and the enactment of the Commercial Space Launch Amendments Act of 2004, AST work with RLV operators will continue to increase in FY 2010. This increased workload begins in the preapplication phase and continues through the environmental assessment, the air traffic evaluation, and the development of memorandums of agreement to facilitate new operators. Several companies are implementing plans to provide the public with the means to get to space within the FY 2010 to 2011 timeframe with test operations occurring in FY 2010. Human space flight adds a complicating dimension to permit and license evaluations. In December 2008 NASA's Commercial Orbital Transportation Services (COTS) demonstrations yielded two contract awards for Commercial Resupply Services (CRS) to the International Space Station. These two launch providers, SpaceX and Orbital Sciences Corporation, will require FAA/AST launch and reentry licenses for an anticipated 20 launches that will commence in FY 2010. Additionally, Orbital Sciences plans to launch their vehicles from the Wallops Island launch facility, marking a major break from past launch activity which relied heavily on Air Force support at the Eastern and Western Ranges. The level and scope of the contracted activity, as well as the addition of new launch sites, will place significant new burdens on AST.

As a follow-on step to the licensing or permit process, AST will conduct safety inspections to ensure licensees and permitees are adhering to the regulatory requirements. AST conducts at least one annual inspection of site operations at each of the commercial launch sites and, as a minimum, an inspection of launch operations at the time of flight. Currently, there are six licensed launch site operators and AST will conduct six site inspections. In addition to inspections of launch operations at the time of flight, inspections may be conducted before and/or after the time of flight covering activities that occur during launch vehicle preparation and verifying that required post-flight events have occurred. The number of expendable launch vehicle (ELV) launches and inspections are expected to increase from FY 2009. Furthermore, we expect to be conducting safety inspections of reentry operations in FY 2010, and these will pose new and unique challenges. Reusable launch vehicle (RLV) launches are difficult to predict with accuracy. In FY 2010 we anticipate making about three experimental permit determinations. We expect many RLV launches to be conducted under experimental permits as those vehicles and operations continue to undergo testing, training, and research and development. Estimates for RLV launches range from 25 to 40 or higher. FAA expects to see a spike in the number of permitted launch operations as a result of an increase in the number of permitted activities in FY 2010.

AST will conduct regulatory development projects and activities pertaining to U.S. commercial space transportation. Major FY 2010 activities under this program include: Explosive Siting, trajectory dispersion methodology for piloted RLVs, and the GPS Users Guide for RLV Navigation and Tracking.

AST will continue its collaboration with DoD and coordination with NASA through the Common Standards Working Group to maintain common launch safety requirements and other common safety standards and facilitate DoD's understanding of commercial space entrepreneurial capabilities. AST will continue its support and collaboration with NASA on its COTS initiative.

AST's research supports the development of appropriate safety regulations and standards to keep pace with a developing space industry. Each year a call for new research projects in support of the industry, to be accomplished during the following fiscal year, is announced within the AST office and to the members of the Commercial Space Transportation Advisory Committee (COMSTAC), RLV, and Launch Operations Support Working Groups. COMSTAC membership is made up of senior executives from the U.S. commercial space transportation industry, including entrepreneurial firms as well as large aerospace companies; the satellite industry; space-related state government officials; academia; and representatives from space advocacy organizations. AST receives approximately 12-15 project ideas each year. The projects are evaluated to determine if they support the AST safety and promotion goals. The suggested projects are ranked as to the likelihood of a successful outcome with topics that may soon be useful in the development of new safety practices, which rank highest. Projects often include a review of current modeling techniques, a literature search to determine the current state of technological developments, and evaluating alternative safety methodologies that may be proposed by the industry. The most promising two to three projects, depending on estimated cost, are pursued.

AST continues the development of the draft requirements and architecture of the first automated Space and Air Traffic Management System (SATMS) Decision Support Tool (DST) application. The tool supports launch and reentry mission planning. SATMS represents a conceptual "aerospace" environment in which space and aviation operations are seamless and fully integrated in a modernized, efficient National Airspace System (NAS). Demand for access to the nation's airspace by aviation users (civil, military, and general) continues to increase. As a result, the need to continually improve the safety and efficiencies of tools and processes are paramount to the SATMS vision. The SATMS DST will be utilized to identify space vehicle airspace requirements, identify and plan for air traffic reroutes and enable space vehicles to be tracked through the NAS. Phase 2 of the development began in FY 2009 and will include an evaluation of the initial draft requirements.

AST will publish an Industry Developments and Concepts Report, a Commercial Space Transportation Forecast, and four quarterly launch reports to provide information concerning the significant changes that are taking place in commercial space transportation. In developing forecasts, year-in-review documents and special topic reports, AST gathers information, evaluates the sources of the data, and analyzes and displays the information clearly to inform both the public and the industry. These reports are used by industry to measure its performance in the commercial market, by state governments to influence the development of new space launch activities, and by the DoD and NASA as they review their launch requirements. AST conducts a public Space Transportation Conference with an agenda based on industry and government feedback that has senior level interest.

The AST Education Initiative reaches out to students, teachers, and academic administrators to develop knowledge and awareness of the commercial space transportation industry and its career potentials, as well as increase the interest and participation in the areas of science, math, and engineering. AST will participate in local school career days, educational conferences and programs, develop partnerships with other organizations, and develop materials for publication and for the AST website.

AST's Organizational Excellence activities are geared toward enabling its staff to meet the challenges of its primary mission – to ensure the protection of the public, property, and the national security and foreign policy interests of the United States – efficiently and effectively. AST seeks to improve its organizational performance by its efforts in three areas: human resource management, fiscal resource management, and training. AST supports the agency's lead in strategic management areas, including the early dispute resolution system, workforce planning, and performance planning. AST's efforts toward organizational excellence also address its requirement to be good stewards of the public funds. AST will expand its efforts to obtain a broader range of customer feedback and will continue its scrutiny of budget requirements and spending in its cost control effort.

AST will continue to focus on enhancing the knowledge and proficiency of its technical and professional staff in areas unique to space transportation. It will use a mix of commercial, government, and internally developed courses to provide at least 1,800 student-hours of professional development and technical training for AST staff.

Explanation of Funding Changes for Commercial Space Transportation (AST)

	Dollars ($000)	FTE
Commercial Space Transportation (Net Change from FY 2009 Enacted)	**$643**	**2**
Overview: For FY 2010, the Associate Administrator for Commercial Space Transportation requires $14,737,000 and 70 FTE to meet its mission of protecting the public, property, and national security and foreign policy interests of the United States during a commercial launch or reentry activity and to encourage, facilitate, and promote U.S. commercial space transportation. The FY 2010 request for this activity is an increase of $643,000 (4.6 percent) and annualizes two FTE (2.9 percent) from FY 2009. The FY 2010 request level reflects unavoidable pay raises and inflation. The FY 2010 FTE request level consists of the annualization of two FTE hired in FY 2009.		
Unavoidable Adjustments		
Annualized FTE: This represents the net annualized costs of FY 2009 new hires and attrition.	270	2
Annualized FY 2009 Pay Raise (GS Population): This pay raise has been calculated separately based on the employee population still under the General Schedule. This increase is needed to provide for the full-year cost associated with the 3.9 percent average government-wide pay raise in January 2009. The actual factor used is 4.8 (3.9 percent plus 0.9 percent average of Within-Grade increases). The FY 2009 portion of this pay raise will be absorbed within enacted amounts; this increase covers the first quarter of FY 2009.	10	
Annualized FY 2009 Pay Raise (Core Comp Population): This pay raise has been calculated separately based on the employee population under the Core Compensation pay plan. This increase is needed to provide for the full-year cost associated with the Organizational Success Increase (OSI) and the Superior Contribution Increase (SCI) awarded in FY 2009. The OSI is 100 percent of the 3.9 percent average government-wide pay raise plus 1.0 percent (4.9 percent). The Core Compensation system awards three different pay raises—20 percent of the population receive the OSI plus a 1.8 percent SCI, 45 percent receive the OSI plus a 0.6 percent SCI, and 35 percent receive just the OSI. The FY 2009 portion of this pay raise will be absorbed within enacted amounts; this increase covers the first quarter of FY 2010.	94	
FY 2010 Pay Raise (GS Population): This pay raise has been calculated separately based on the employee population under the General Schedule. This increase is required to provide for costs associated with base salary increases. The factor used is 2.9 percent, composed of the projected 2.0 percent government-wide pay raise in January 2010 plus 0.9 percent average of Within-Grade	22	

	Dollars ($000)	FTE
increases.		
FY 2010 Organizational Success Increase (OSI) (Core Comp Population): This pay raise has been calculated separately based on the employee population under the Core Compensation pay plan. This increase is required to provide for costs associated with base salary increases that are provided to employees meeting or exceeding job expectations. The factor used is 3.0 percent, composed of the projected 2.0 percent government-wide pay raise in January 2010 plus 1.0 percent for the full OSI increase (derived from the elimination of Within-Grade increases). A fundamental component of the FAA's pay-for-performance system, this increase assumes FAA will meet most of its FY 2009 performance goals.	186	
FY 2010 Superior Contribution Increase (SCI): This increase is required to provide for costs associated with base salary increases that are provided to employees in the Core Compensation system providing superior contributions to the organization. The factor used is 1.8 percent for 20 percent of the population and 0.6 percent for 45 percent of the population. The remaining 35 percent do not receive this increase.	39	
Non-Pay Inflation: This increase is needed to provide for inflationary cost increases consistent with OMB guidance that uses the FY 2010 GDP price index (year over year) of 0.5 percent.	24	
Base Transfers		
Panorama Business Views (PB Views): The FAA's Strategic and Business Planning efforts are now fully incorporated into the agency's management process. In order to manage the FAA's Strategic and Business Planning program, all Operations-funded Lines of Business and Staff Offices are transferring funds totaling $1,197,000 to the Office of Aviation Policy, Planning, and Environment in support of this agency-wide effort.	-2	

Resource Summary

AST

	FY 2008 Actual [1]	FY 2009 Enacted	Unavoidable Changes	Discretionary Changes	FY 2010 Request
Funding ($000)					
PC&B	7,722	9,300	566	-	9,866
Other Objects					
Travel/Transportation	534	714	16	-	730
Other Services	3,945	3,856	4	-	3,860
RCU [2]	30	30	3	-	33
Other [3]	195	194	54	-	248
Total	4,705	4,794	77	-	4,871
Total	**12,427**	**14,094**	**643**	**-**	**14,737**
Staffing					
EOY (FTP)	60	71	-	-	71
OTFTP	2	1	-	-	1
Total FTEs (Includes FTP and OTFTP)	57	68	2	-	70

1 FY 2008 derived from actual obligations.

2 Rents, Communications, Utilities.

3 Printing & Reproduction Services, Supplies & Materials, Equipment, Land & Structures, and Insurance Claims & Indemnities.

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OPERATIONS APPROPRIATION

Staff Offices
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2009 Enacted (Omnibus)	**765,454**	**2,692**	**87**	**2,766**
FY 2009 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0	17		17
2. Annualized FY 2009 Pay Raise (GS Population)	533			
3. Annualized FY 2009 Pay Raise (Core Comp Population)	3,161			
4. January 2010 Pay Raise (GS Population)	1,220			
5. January 2010 OSI (Core Comp Population)	6,280			
6. January 2010 SCI	1,319			
7. Non-pay inflation	2,151			
8. GSA Rent Increase	6,325			
Total Unavoidable Adjustments	**20,988**	**17**	**0**	**17**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. DOL Wage Determination Increases	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. Air Traffic Controller Hiring	0			
2. NextGen Staffing Increase	0			
3. UAS / Drug Inspector Staffing	0			
4. AVS Analytical Program Staff	0			
5. ASIAS Contract Support	0			
6. NextGen Environmental/Noise	1,665	5		5
7. Congestion Studies	216	3		3
8. National Security Systems Classified/ Controlled Information	1,300	9		9
9. National Security Coordination Division/ Counter Intelligence	713	5		5
10. Equal Employment Opportunity (EEO) and Civil Rights Programs	692	7		7
11. FAA Privacy Program	2,557	7		7
12. Automated Staffing and Processing (ASAP)	500			
13. Financial Systems Upgrades	1,600			
Total Discretionary Increases	**9,243**	**36**	**0**	**36**
Cost Efficiencies				
1. Rents, Utilities, and Leases	0			
2. Service Center Business Process Reengineering	0			
3. Administrative Overhead Efficiencies	0			
Total Cost Efficiencies	**0**	**0**	**0**	**0**
Base Transfers				
1. Air Traffic Controller Hiring Support	331	4		4
2. Automated Staffing and Application Process (ASAP) System Enhancements	148	1		1
3. Labor Relations Improvements	158	1		1
4. Technical Library	651	2		2
5. Office of Audit and Evaluation	693	6		6
6. Panorama Business Views (PB Views)	1,114			
7. Tech Ops Hiring	450	2		2
8. Litigation Support	2,000	9		5
9. Emergency Communications	514	5		5
10. FAA Historian	184	1		1
11. Clinical Psychologist	0			
12. Acquisition Support (AMQ) to Franchise Fund	0	-59		-59
Total Base Transfers	**6,242**	**-28**	**0**	**-32**
FY 2010 Request	**801,927**	**2,717**	**87**	**2,787**

OPERATIONS APPROPRIATION

Financial Services (ABA)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2009 Enacted (Omnibus)	**111,004**	**163**		**163**
FY 2009 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0			
2. Annualized FY 2009 Pay Raise (GS Population)	0			
3. Annualized FY 2009 Pay Raise (Core Comp Population)	237			
4. January 2010 Pay Raise (GS Population)	0			
5. January 2010 OSI (Core Comp Population)	471			
6. January 2010 SCI	99			
7. Non-pay inflation	450			
8. GSA Rent Increase	0			
Total Unavoidable Adjustments	**1,257**	**0**	**0**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. DOL Wage Determination Increases	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. Air Traffic Controller Hiring	0			
2. NextGen Staffing Increase	0			
3. UAS / Drug Inspector Staffing	0			
4. AVS Analytical Program Staff	0			
5. ASIAS Contract Support	0			
6. NextGen Environmental/Noise	0			
7. Congestion Studies	0			
8. National Security Systems Classified/ Controlled Information	0			
9. National Security Coordination Division/ Counter Intelligence	0			
10. Equal Employment Opportunity (EEO) and Civil Rights Programs	0			
11. FAA Privacy Program	0			
12. Automated Staffing and Processing (ASAP)	0			
13. Financial Systems Upgrades	1,600			
Total Discretionary Increases	**1,600**	**0**	**0**	**0**
Cost Efficiencies				
1. Rents, Utilities, and Leases	0			
2. Service Center Business Process Reengineering	0			
3. Administrative Overhead Efficiencies	0			
Total Cost Efficiencies	**0**	**0**	**0**	**0**
Base Transfers				
1. Air Traffic Controller Hiring Support	0			
2. Automated Staffing and Application Process (ASAP) System Enhancements	0			
3. Labor Relations Improvements	0			
4. Technical Library	0			
5. Office of Audit and Evaluation	-167	-1		-1
6. Panorama Business Views (PB Views)	-14			
7. Tech Ops Hiring	0			
8. Litigation Support	0			
9. Emergency Communications	0			
10. FAA Historian	0			
11. Clinical Psychologist	0			
12. Acquisition Support (AMQ) to Franchise Fund	0			
Total Base Transfers	**-181**	**-1**	**0**	**-1**
FY 2010 Request	**113,681**	**162**	**0**	**162**

Detailed Justification for Staff Offices – ABA

Financial Services (ABA)	FY 2010 Request: $113,681

Overview:

The Assistant Administrator for Financial Services/Chief Financial Officer advises the agency of FAA plans and programs for budget, financial management, and performance management.

The Assistant Administrator for Financial Services:

- Provides accounting, financial, and audit liaison services.
- Manages FAA accounting systems.
- Oversees the capitalization of a multi-billion dollar asset base.
- Implements and oversees agency internal control program in compliance with OMB Circular A-123.
- Ensures that agency budgetary needs are identified and justified.
- Ensures that agency funds and resources are utilized effectively.
- Adheres to OMB Circular A-11 regarding apportionment, reapportionment, funds control, and reporting status of funds and budgetary resources.
- Develops policies, programs, standards, systems, and procedures for budget, financial, and performance management.
- Develops and manages the implementation of the organizational structure and issues administrative standards and procedures.
- Provides oversight of the agency's cost reduction efforts.
- Manages cost accounting system.
- Administers OMB Circular A-76, Performance of Commercial Activities.
- Serves as the agency's Chief Financial Officer (CFO).

FY 2009 Program:

The Assistant Administrator for Financial Services/CFO (ABA) will continue to enhance agency financial business processes through improvements to DOT's "Delphi" financial management system. In FY 2009, ABA will centralize major segments of the capitalization process to strengthen financial controls and improve the reliability of financial data. In addition, ABA plans to implement improved automated workflow and document imaging, making the capitalization process more efficient and less labor intensive. ABA will also focus on continuing to achieve a "clean audit" with an emphasis on improved internal controls. In support of the *Flight Plan*, ABA will continue to implement cost efficiency initiatives, delivering on agency goals for cost control.

With the Human Resources organization, ABA co-leads and contributes directly to the Organizational Excellence goal. Secondarily, ABA supports the agency's Safety, Capacity, and International goals.

Anticipated FY 2009 Accomplishments:

- Continue to improve Delphi, including implementation of commitment accounting and DELPHI enhancements to budget execution to better track F&E project authorizations.
- Obtain an unqualified opinion on agency financial statements with no material weaknesses.
- Continuously improve the agency-wide cost control program.
- Provide analytic, resource-based support to the agency's investment processes and negotiations with labor unions.
- Document and test internal controls over key business processes.
- Enhance financial management training agency-wide to ensure that executives and managers understand their fiscal roles and responsibilities.
- Maintain the Cost Accounting System (CAS) to improve the utility of financial information and support the user fee program.
- Ensure Flight Plan initiatives are fully funded by the beginning of FY 2009.
- Initiate agency budget formulation by providing top executives with policy options and recommendations. Guide decisions that establish the constraints and performance framework within which FAA organizations formulate their budgets.
- In collaboration with the Assistant Administrator for Aviation Policy, Planning and Environment, ensure that FY 2009 business plans include financial and budget information and reflect improved goal attribution.
- Continue to ensure agency compliance with the Funds Control Order and the Funds Control Standard Operating Procedures implemented in FY 2007.
- Continue to implement and improve the centralized structure for oversight of reimbursable work.
- Review acquisitions of $10 million or more to ensure the procurement represents a good investment of taxpayer resources and that appropriate alternatives were considered.
- Implement reviews of conferences with cost estimated at $100,000 or more to ensure they represent a wise investment of taxpayer dollars and proper guidelines are followed.
- Implement an investment analysis process for investments being reviewed by the Information Management Technology Board.

FY 2010 Budget Request:

For FY 2010, the Assistant Administrator for Financial Services/CFO requests $113,681,000 and 162 FTE to meet its mission. This increase will provide for pay raises and inflation. The request also provides $1.6 million for financial system upgrades.

Capitalization: FAA continues to integrate its capitalization process throughout FAA regions, centers, and headquarters. Program managers in headquarters spend 85 percent of the money for capital programs, however program staff in the regions coordinate the implementation of the programs. ABA will continue to integrate many of the key capitalization functions between headquarters and the regional service centers to improve financial controls throughout the process. This will continue to ensure accurate and timely asset accounting in FY 2010 and beyond.

Current capitalization efforts were being supplemented by contract resources. In FY 2009, ABA was not able to convert all of its' 19 FTE contract resources into government positions. However, in FY 2010 FAA will complete the Converting of contractor resources to Full Time Equivalents (FTE) which will help sustain operations and provide a more cost effective solution. The FAA will be better able to sustain Clean Audit opinions with no Material Weaknesses. FAA employees continue to support the following improvements:

- Accurate and timely audit-ready records throughout the year.

- Streamlined processes and elimination of redundant work.
- Consistent application of project setup and the processing of transactions.
- Enhanced internal controls to prevent inaccurate or untimely data.
- Analysis and correction of inaccurate information immediately upon detection.
- Reinforced policies and procedures for an integrated FAA wide system.

Financial Systems Upgrades: The additional $1.6 million in funding will allow ABA to continue the development and implementation of FAA's financial system and reporting activities. This includes enhancements to the Funds Control Module (FCM) in support of the Reimbursable reporting process, implementation of an enhanced payroll labor analysis and reporting tool, and the required mandate by Office of Management and Budget (OMB) and Department of Transportation (DOT) to upgrade the financial system Delphi to meet government-wide goals and initiatives. Some of the major initiatives that will continue in FY 2010 are highlighted below.

The conversion to Oracle 12.FISO is another major initiative. Delphi uses Oracle's federal financial software for the core accounting system. In FY 2010, FAA will continue to work with DOT to upgrade the existing version of Delphi to 12.FISO. The FISO upgrade will require a total reimplementation of the system and complete data conversion. This represents a substantial level of effort to plan for and implement within FAA while having to maintain the existing system. Major benefits include: Federalized Project Accounting Module, Budgetary to Proprietary Accounting, Automated Prior Year Recovery and XML-based data extracts that will replace many standard reports for use with tools like Microsoft Excel, Word or Acrobat.

Business process re-engineering will be required to accommodate these major initiatives. FAA will develop processes to improve data integrity and clean up current data to prepare for the complete re-implementation and data conversion to Oracle 12.FISO.

ABA will develop a system to track FTE and Full Time Permanents (FTP) for the Operations appropriation. This system will enable FAA to have better controls on FTE levels.

Other Program Areas: All current executives and managers continue to need the requisite tools and training on how best to use cost data in decision making. ABA will reinforce use of these skills as part of the agency-wide cost control program. ABA will continue to improve Delphi, PRISM, CAS, and Labor Distribution and Reporting (LDR) and will provide timely and accurate CAS reports. ABA will provide configuration management and other policy, procedures, and security for FAA financial management systems; and assure that agency executives and managers are aware of the financial information available for their use in program analysis and decision making.

ABA will lead FAA in monitoring and reviewing contracts. Based upon internal agency and Office of Inspector General (OIG) recommendations, the Administrator mandated that the Chief Financial Officer approve any proposed acquisition of $10 million or more. The Office of Financial Controls (AFC) will continue to conduct reviews of these acquisitions to ensure that FAA takes the proper steps to award, administer, and monitor contracts. The Office of Financial Management (AFM) will oversee the documentation and testing of controls of key business processes such as procurement, property management, and payroll to ensure the integrity of financial data and reduce the risk of cost mismanagement.

ABA will also continue to lead the agency's efforts at reducing costs and implementing business-like practices such as strategic sourcing and performance and efficiency metrics. The use of these types of processes will continue the efforts that have taken place over the last several years to make the agency more efficient and effective.

The Office of Budget (ABU) continues to replace its staff, due to several vacancy position this will allow ABU to increase its analytical capability. The result will be better budgeting, stronger financial oversight, and improved responsiveness to Congress, Office of Management and Budget (OMB), General Accountability Office (GAO), and the Office of the Inspector General (OIG). ABU's stronger analytical skill strengthens performance integration and improves out-year planning.

The Office of Budget shares agency management and support for strategic and business planning with the Assistant Administrator for Aviation Policy, Planning and Environment (AEP). AEP determines agency performance measures and annual targets and works with line and staff organizations to develop core business measures and targets. The Office also monitors performance and provides feedback to performance target leads.

OPERATIONS APPROPRIATION

Human Resource Management (AHR)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2009 Enacted (Omnibus)	**96,091**	**587**	**32**	**616**
FY 2009 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0			
2. Annualized FY 2009 Pay Raise (GS Population)	0			
3. Annualized FY 2009 Pay Raise (Core Comp Population)	771			
4. January 2010 Pay Raise (GS Population)	0			
5. January 2010 OSI (Core Comp Population)	1,531			
6. January 2010 SCI	322			
7. Non-pay inflation	140			
8. GSA Rent Increase	0			
Total Unavoidable Adjustments	**2,764**	**0**	**0**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. DOL Wage Determination Increases	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. Air Traffic Controller Hiring	0			
2. NextGen Staffing Increase	0			
3. UAS / Drug Inspector Staffing	0			
4. AVS Analytical Program Staff	0			
5. ASIAS Contract Support	0			
6. NextGen Environmental/Noise	0			
7. Congestion Studies	0			
8. National Security Systems Classified/ Controlled Information	0			
9. National Security Coordination Division/ Counter Intelligence	0			
10. Equal Employment Opportunity (EEO) and Civil Rights Programs	0			
11. FAA Privacy Program	0			
12. Automated Staffing and Processing (ASAP)	500			
13. Financial Systems Upgrades	0			
Total Discretionary Increases	**500**	**0**	**0**	**0**
Cost Efficiencies				
1. Rents, Utilities, and Leases	0			
2. Service Center Business Process Reengineering	0			
3. Administrative Overhead Efficiencies	0			
Total Cost Efficiencies	**0**	**0**	**0**	**0**
Base Transfers				
1. Air Traffic Controller Hiring Support	331	4		4
2. Automated Staffing and Application Process (ASAP) System Enhancements	148	1		1
3. Labor Relations Improvements	158	1		1
4. Technical Library	0			
5. Office of Audit and Evaluation	0			
6. Panorama Business Views (PB Views)	-13			
7. Tech Ops Hiring	450	2		2
8. Litigation Support	0			
9. Emergency Communications	0			
10. FAA Historian	0			
11. Clinical Psychologist	0			
12. Acquisition Support (AMQ) to Franchise Fund	0			
Total Base Transfers	**1,073**	**8**	**0**	**8**
FY 2010 Request	**100,428**	**595**	**32**	**624**

Detailed Justification for Staff Offices – AHR

Human Resource Management (AHR)	FY 2010 Request: $100,428

Overview:

The mission of the Assistant Administrator for Human Resource Management (AHR) is to advise and assist the Administrator in directing, coordinating, controlling and ensuring the adequacy of FAA plans and programs for personnel, training, workforce/human capital planning and measurement, and labor relations. AHR also provides leadership, policy, and direction to FAA in Human Resource Management (HRM) policy and activities.

FAA leadership must make wise investments in human capital. We must implement strategies that result in our employees achieving a high level of performance. We must also strive to provide quality human resource management services to support the men and women of FAA charged with getting the flying public safely to their destination.

FY 2009 Program:

People are the foundation for FAA's mission accomplishment. AHR advises on and supports the management of FAA's people. The FAA's corporate vision and goals aim for true organizational excellence as we continue our global aviation leadership role far into the 21st century. The FAA's strategic plan, called the *Flight Plan*, stresses that success will ultimately depend on the capabilities, effectiveness and efficiency of the men and women - the human capital - of FAA, to bring the *Flight Plan* to life.

AHR's human capital strategies must align strategically with FAA Flight Plan goals and vision. People are FAA's most valuable asset. Only a skilled, knowledgeable, talented, and high-performing workforce can handle the demands of achieving FAA's safety, capacity, and international aviation goals. AHR's intention is to support these goals by creating innovative, flexible, efficient, and effective personnel systems and policies.

Anticipated FY 2009 Accomplishments:

- Improve the process for hiring air traffic controllers to ensure the agency has the capacity to achieve anticipated strategic staffing requirements; monitor implementation of the yearly general public announcement schedule.
- In external recruitment efforts, implement corporate strategies that result in attracting high quality candidates to FAA for employment. This will include undertaking activities to cultivate relationships and form partnerships with veterans' organizations, colleges, universities, professional organizations, and other organizations that assist the public in seeking employment opportunities; promoting and partnering with the Department of Veterans Affairs' Vocational Rehabilitation and Employment Service to place disabled veterans in a cooperative education and/or non-paid work experience at FAA.
- Enhance the Selections Within Faster Time (SWIFT) automated suite to expand its ability to accommodate additional alternative hiring methods, and more easily accommodate new job series.
- Manage and enhance the Federal Personnel and Payroll System (FPPS), Consolidated Automated System for Time and Labor Entry (CASTLE), web-based Learning Management System (eLMS) and other supporting subsystems within FAA in accordance with established timelines.
- Sustain and improve agency human capital planning and measurement processes by completing the annual update of the FAA Human Capital Plan; leading and/or participating in FAA and DOT-level workgroups to conduct competency modeling and assessment, close skill gaps in agency mission-critical occupations through innovative human capital solutions, and report results.
- Lead the FAA Human Capital Planning Council and provide guidance and tools to sustain and

institutionalize the workforce planning process; review line of business and staff offices workforce plans to ensure alignment with FAA human capital needs and government-wide human capital management requirements.

- Develop, analyze, interpret, and report on results from agency human capital measures, including FAA separation questionnaire, employee retention metrics, management and applicant satisfaction indicators, organizational surveys (e.g. employee engagement) and government-wide hiring efficiency measures to monitor agency human capital management practices.
- Begin the process to implement the government-wide comprehensive "End-to-End" hiring initiative focused on improving the efficiency and effectiveness of agency recruitment, onboarding and external hiring processes by implementing data collection procedures and establishing baselines for human capital measures that assess applicant and manager satisfaction with hiring process, new hires feedback on recruitment, onboarding, and orientation processes, as well as one and two-year indicators of retention.
- Coordinate and manage the conduct of the U.S. Government Accountability Office's audit of FAA Human Capital Management practices.
- Administer, analyze, interpret and communicate results from the FAA 2008 Federal Human Capital Survey (FHCS) and develop a corporate FAA action plan to improve strategic management of agency workforce.
- Provide corporate guidance and consultation to FAA organizations on developing Organizational Excellence action plans to improve employee engagement, leadership and accountability, and management of performance.
- Put in place a corporate mentoring process pilot to support employee and leadership career planning and development.
- Assist Lines of Business and Staff Offices in aligning their specialized competency models with standardized corporate competency models.
- Establish agency guidelines on mentoring.
- Make tools available to support mentoring activities in the FAA.
- Manage the operations, maintenance and enhancement of the agency web-based learning management system (eLMS) in keeping with established activity goals and timelines.
- Manage and enhance the FAA learning enterprise architecture (LEA) to provide a corporate learning infrastructure that ensures effective use of corporate resources and elimination of redundant learning systems.
- Develop and implement a marketing campaign to increase employee awareness of the Employee Leadership Success Profile, available eLMS training and careers planning guides.
- Develop and implement an ongoing training strategy for eLMS system administrators and users.
- Coordinate and manage agency wide enrollments in Federal Executive Institute, Executive Potential Program, Executive Leadership Program, and other corporate leadership development programs.
- Prepare and disseminate educational materials to meet congressionally mandated Constitution Day requirements.
- Pilot new reporting and accountability processes to improve compliance with probationary training and certification requirements.
- Implement online 180° assessment tools to identify critical leadership skill gaps, focus individual development, and define corporate training priorities.
- Conduct leadership skill gaps assessment; define emerging strategic challenges; and identify FY 2010 delivery priorities to meet identified needs and emerging challenges.
- Conclude core training activities and graduate the first Senior Leadership Development Program cohort. Evaluate lessons learned and initiate selection of a second cohort.
- Pilot the new Program for Emerging Leaders, targeting non-supervisory employees who aspire to management.
- Develop agency-wide succession planning processes to forecast leadership requirements, assess current bench strength, and develop robust candidate pipelines.

- Develop strategies for strengthening frontline leadership.
- Conduct training for employees and managers to promote the use of the new Individual Development Plan function in eLearning Management System (eLMS). Revalidate the Managerial Success Profile and Employee Leadership Development Guide.
- AHR will develop an FAA family emergency support plan to meet the requirements of Federal Continuity Directive 1 Annex A Program Plans and Procedures and Annex A, Human Capital.
- Continue effective workers' compensation program management and maintenance of cost containment obtained by consolidation of the corporate program; ensure that cost avoidance measures lead to FAA's chargeback bill increase at a lower rate than the government-wide increase; mitigate workers compensation costs through proactive management and centrally managing claims for the entire FAA.
- Implement programs and processes to attract and retain a qualified FAA workforce.
- Build the leadership capabilities of the executive corps by providing FAA Executive Series seminars, Forum for Executive Excellence, and participating in multi-agency, low-cost executive development opportunities.
- Promote the continuity of senior leadership through executive development and succession planning; review and update succession planning and analysis of executive positions; continue to project and monitor priority staffing requirements.
- Ensure that human resource executive policies and processes are kept current and support and attract a strong executive leadership cadre.
- Develop and provide labor relations training for agency supervisors and managers based on needs assessment for additional training.
- Continue to monitor labor relations service level agreements to ensure that business requirements are met.
- Use an electronic tracking system to monitor grievance processing time and reduce FY 2009 processing time by at least 30 percent from the FY 2006 baseline.
- Provide oversight and ensure compliance of all bargaining with FAA unions.
- Facilitate accurate reporting of official time through continued oversight and management.
- Support FAA efforts to prevent workplace injuries and enhance worker safety by ensuring integration of employee safety in FAA management training.
- Continue to ensure a better understanding of the accountability board and application of corporate policies, in order to foster a professional workplace free of harassment and other types of misconduct that impact the ability to accomplish FAA's mission.
- Hold FAA leadership accountable for responding to allegations falling under the scope of the accountability board order to ensure that management addresses inappropriate workplace conduct fairly and in a timely and consistent manner.
- Develop and provide policy guidance to HR Offices, managers and specialists and Line of Business/Staff Offices on FAA compensation, classification, hiring and employment, performance management and awards, leave, work hours, premium pay, HR policy web content, comprehensive policy development/issuance instructions, and on program areas such as Voluntary Leave Transfer Program, assisting with SCI appeals, establishing position requests (waivers), responding to Freedom of Information Act/Congressionals, etc.
- Provide day to day operational support and services to FAA managers on compensation, staffing, labor and employee relations, employee safety and workers' compensation programs, employee assistance program, benefits, awards, training and human resources automation.
- Implement HR operational services improvements, including evaluation of shared services centers and HR accountability reviews.
- Develop, implement and evaluate employment service level agreements to meet the requirements of our lines of businesses and staff offices.
- Maintain sick leave usage consistent with the government-wide sick leave average through continued oversight and management.
- Promote and enhance the quality of FAA childcare facilities through program assessments of FAA centers, providing annual training to Program Directors and Boards of Directors; developing a

national marketing campaign to increase employee utilization; standardizing, tracking, and reporting childcare information.

- Promote the Employee Assistance Program (EAP) and WorkLife services to FAA employees and their families by sponsoring quarterly promotional events, tracking participation, and assessing the need for ancillary services.

FY 2010 Budget Request:

For FY 2010, the Assistant Administrator for Human Resource Management requests $100,428,000 and 624 FTE to meet its mission, an increase of $4.3 million 8 FTE above the FY 2009 enacted level. This increase provides for basic pay raises and inflation for AHR base programs, as well as an increase of $500,000 for automated Staffing and Application Process (ASAP). ASAP provides a web-enabled, user-friendly staffing solution to FAA's unique hiring process, with instant certification of qualified candidates for employment. The requested amount also reflects a net increase of $1.1 million and 8FTE transferred from other FAA organizations to better align our resources. Of this amount, $928,000 is from the Air Traffic Organization to support air traffic controller and technical Operations hiring; $158,000 is from Aviation Safety to finalize the consolidation of labor relations personnel.

In FY 2010, the government-wide Federal Human Capital Survey (FHCS) will be administered by the Department of Transportation and U.S. Office of Personnel Management in a web-based environment. The FAA will continue to participate in this survey of its human capital management practices, examine the impact of the corporate FAA FHCS action plan on agency results, and comply with section 1128 of Public Law 108-136 requirement for an annual survey of employees.

AHR will continue to provide corporate agency guidance and consultation as necessary to monitor and assess the implementation of FAA Organizational Excellence Action Plans to address employee feedback and engagement. Specifically, AHR will implement an action plan focused on improving employee engagement drivers related to AHR organizational performance and workforce retention.

In 2010, AHR will lead the coordination and development of the agency's response to GAO's findings and recommendations from their audit of FAA Human Capital Management.

The FAA Human Capital Plan has been updated through FY 2013. AHR will continue to provide oversight for ongoing workforce planning and annual plan updates by providing workforce data, updated guidance/requirements, tools and consultation to Lines of Business and Staff Offices. Updated workforce plans will be reviewed to determine the extent to which plans identify workforce gaps in target workforces and have implemented strategies/initiatives to close those gaps. The annual update to the FAA Human Capital Plan that is based on analysis of the workforce, mission demands, human capital challenges and initiatives needed to accomplish FAA Flight Plan goals will be completed. AHR will review the operation of the FAA Human Capital Planning Council with a focus on improving agency participation in council activities; improving communication of lessons learned from workforce planning, and strengthening accountability for a more integrated approach to agency human capital planning. AHR will design and implement a Human Capital Accountability System that ensures the agency maintains a legally defensible and merit-based personnel system by consistently monitoring, assessing, evaluating and measuring the results from agency human capital management policies, programs, systems and initiatives. The accountability system will provide a structured means to maintain oversight for FAA's human capital management practices and necessary corrective actions.

AHR will continue to lead, participate on and work collaboratively with Government-wide/OPM, DOT and FAA internal work groups to conduct workforce planning and analyses, develop competency models, and conduct competency assessments for mission critical occupations/workforces including Information Technology (IT), Acquisition Specialists, Engineers, Community Planners, Human Resource Management (HRM) Specialists. Results from assessments will be analyzed, interpreted and reported to DOT, OPM and other external stakeholders to identify effective solutions for closing skill gaps in mission critical occupations/workforces; improve strategic management of agency's workforce and demonstrate compliance with federal regulations for institutionalizing effective human capital practices.

AHR will continue to develop opportunities and participate in activities that will increase FAA's visibility as an employer of choice to current and future job seekers. This initiative will be monitored through the use of an FAA Separation Questionnaire. AHR will analyze 2009 data from the agency Separation Questionnaire and compare to previous trend data to develop results report; apply results to update metrics in the FAA Human Capital Plan; provide results to support recruitment and retention strategies; and communicate 2009 FAA Separation Questionnaire results to agency management and the workforce. AHR will work collaboratively with other interested FAA offices in marketing aviation as a career by means of school visits and appearances at other events geared toward educating young people. AHR will also cultivate relationships and form partnerships with veterans' organizations, colleges, universities, professional organizations, and other organizations that assist the public in seeking employment opportunities. In addition, AHR will improve recruitment processes for operational efficiency and reduce the time it takes to fill mission critical positions by 20 percent over the 2003 baseline.

AHR will continue to manage the operations, maintenance and enhancement of the agency web-based learning management system (eLMS) in keeping with established activity goals and timelines.

Agency requirements for training and enhanced learning opportunities continue to expand in support of leadership development initiatives, mission critical hiring and technology modernization. The learning enterprise architecture (LEA) continues to develop to meet agency requirements. AHR will continue overseeing the development of the LEA so that corporate resources are used in an effective and efficient manner.

In FY2010, AHR will implement a comprehensive strategy to strengthen frontline leadership. This will include establishing more rigorous managerial selection processes, improving the timeliness and efficacy of training targeted to new probationary managers, enhancing managerial coaching and mentoring skills, and launching a web-based leadership portal to provide just-in-time advice on key supervisory and managerial issues.

To enhance the quality and effectiveness of core training for frontline, middle, and senior managers we will institute new evaluation processes and introduce best practices for increasing return on investment. We will also pilot new training in strategic planning, labor management relations, and change management to build advanced skills critical to NextGen implementation.

AHR will implement a second cohort of the Senior Leadership Development Process to build a robust pipeline of highly qualified candidates for future executive vacancies. We will also expand participation in the new Program for Emerging Leaders in order to address high turnover in frontline management ranks.

As directed by the Office of Personnel Management, we will build upon previous executive succession planning initiatives to implement a comprehensive leadership succession planning system that encompasses all levels of leadership.

AHR will continue to expand cost-effective non-technical training opportunities to build leadership competence within the FAA workforce, support professional development, and promote continuous learning. This includes leveraging online training, assessment, and mentoring.

AHR will continue to provide low cost Supervisor Skills Training to managers to improve performance in areas highlighted by the Federal Human Capital Survey as well as leave management, management of workers compensation claims, performance management, and related HR practices.

AHR will develop and implement strategies to use the Baldrige Criteria for organizational Performance Excellence to provide a systems perspective across 7 categories (leadership, strategy, customer focus, measurements & knowledge management, workforce engagement, process management, & results) for performance management. Implement actions to address the opportunities for improvement, and submit an application.

AHR will design, implement, and establish Six Sigma as a business management strategy to identify and remove the causes of errors in business processes; implement process improvements for HR priorities.

AHR will develop and implement a business intelligence system (creating & tracking measures) consisting of skills, technologies, applications and practices to acquire a better understanding of its context and improve business decision-making.

Develop and provide a performance review capability which analyzes results of performance audits and evaluations within the Office of Human Resources which determines target areas for performance improvement.

Provide day-to-day operational support and services to FAA managers. This includes compensation, staffing, labor and employee relations, employee safety and workers' compensation programs, benefits, awards, training and human resources automation.

Implement HR operational services improvements, including evaluation of shared services centers and HR accountability reviews.

Evaluate and revise employment service level agreements to meet the requirements of our lines of businesses and staff offices.

In 2010, AHR will continue to develop and provide policy guidance to HR Offices, managers and specialists and Line of Business/Staff Offices on FAA compensation, classification, hiring and employment, performance management and awards, leave, work hours, premium pay, HR policy web content, comprehensive policy development/issuance instructions, and on program areas such as Voluntary Leave Transfer Program, assisting with Superior Contribution Incentive appeals, establishing position requests (waivers), responding to Freedom of Information Act/Congressionals, etc.

AHR will communicate policy/program initiatives, highlights, positions and interpretations through guides, broadcast messages, position/decision papers, memos, telecons, congressionals, and/or 3rd party hearings. Identify the need for and provide briefings/training to customer to enhance understanding of HR policy.

In FY2010, AHR will develop an emergency response plan that integrates and coordinates AHR field and headquarters responses to emergencies.

In FY 2010, AHR will continue to expand and enhance the Selections within Faster Times (SWIFT) automated suite to all mission-critical positions and those positions that cross-organizational lines, i.e., finance, budget, human resources, and information technology. In addition, AHR will also start marketing SWIFT to the remainder of the DOT and to other agencies to capitalize on economies of scale as well as share in maintenance costs.

AHR will continue to manage the operation and maintenance within FAA of personnel and payroll automated processing by the Federal Personnel and Payroll System (FPPS).

In FY 2010, AHR will implement standard operating procedures for the web, database and application development, setup an application helpdesk and Service Level Agreements, associate level 3-application support services contract, develop web and application skills sets, improve documentation of all systems and applications.

In FY2010, AHR will continue to ensure appropriate annual security assessments are conducted. Train AHR employees and implement Secure Zip. Ensure Vera Codes are properly implemented within applications. Research encryption software for AHR systems/servers, thumb drives and workstations (Vontu). Recommend every system have a designated Information Security Officer.

In FY 2010, AHR will provide SOPs and guidelines to the HR community and PMs for FAA's Enterprise Architecture reference model requirements for new and existing AHR systems. Maintain and manage enterprise architecture activities for AHR systems including a configuration control board. Created a baseline for applications; implemented the Change Request (CR) process. Expand System Development

Life Cycle/configuration management to new AHR systems. Update infrastructure and application inventory.

Provide day to day operational support and services to FAA managers on compensation, staffing, labor and employee relations, employee safety and workers' compensation programs, employee assistance program, benefits, awards, training and human resources automation.

AHR will continue to provide corporate executive development opportunities to build leadership capabilities within the executive corps. This will include delivery of the Forum for Executive Excellence and the FAA Executive Series. AHR will promote participation and provide opportunities for executives to participate in low cost, government-wide executive education.

HR will continue to promote the continuity of senior leadership succession planning. Staffing and recruitment priorities will be monitored through annual review and update to the leadership succession planning, analysis, and implementation plan.

Review the FAA Management Leadership Assessment process to determine applicability for implementation at the executive level.

Provide policy guidance and operational support to FAA executives and senior professionals in areas of classification, position management, staffing, compensation, development, and performance management. Manage and update the STI automated system to implement, track, and calculate Short Term Incentive (STI) payments. Review and renew other on-going STI support contract requirements.

Review and make recommendations for updates to executive policies and web information. Additionally, the Executive Resources Staff will continue to assess internal processes for efficiency and effectiveness, and if necessary, will develop Standard Operating Procedures.

AHR will also continue to monitor nationwide grievance processing time against the baseline measured through the grievance electronic tracking system. AHR's intent is to reduce grievance processing time by 30 percent.

Oversight and compliance of all bargaining with FAA unions is an ongoing endeavor for AHR. AHR will monitor and ensure compliance of all bargaining with FAA unions in accordance with FAA Order 3710.18, Internal Coordination Requirements for Negotiating Term and Mid-Term Agreements with FAA Unions, and the Federal Service Labor-Management Statute. Briefings and training on contract administration will be conducted.

The National Air Traffic Controllers Association (NATCA) term agreement implemented in FY 2006 has resulted in new work for AHR. The contract states that a minimum of five arbitration days must be scheduled monthly at headquarters and in each region. This requires increased staffing as well as increased costs for arbitrations, court reporting, and travel. In addition, the AFSCME contract resulted in additional workload due to establishment of a negotiated grievance/arbitration procedure.

Accurate reporting of official time usage continues to be an area of cost containment focus. AHR will facilitate reporting of official time through increased oversight and management. During national term negotiations, AHR will continue to ensure that official time provisions provide an appropriate balance between the union's legitimate need and the agency's operations

AHR will continue to monitor sick leave usage so that the agency usage remains consistent with Government –wide averages. AHR will continue to take action as necessary to remain consistent with targeted levels.

In 2010, AHR will continue to support the FAA workforce through timely and quality employee relations services such as the Employee Assistance Program (EAP) and the child care program. Support will also be provided to ensure uniform and effective handling of misconduct and poor performance cases in a timely and appropriate manner.

AHR will continue to ensure a better understanding of the accountability board and application of corporate policies, in order to foster a professional workplace free of harassment and other types of misconduct that impact the ability to accomplish FAA's mission. As well as hold FAA leadership accountable for responding to allegations falling under the scope of the accountability board order to ensure that management addresses inappropriate workplace conduct fairly and in a timely and consistent manner.

OPERATIONS APPROPRIATION

Regions and Center Operations (ARC)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2009 Enacted (Omnibus)	**331,000**	**839**	**29**	**881**
FY 2009 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0			
2. Annualized FY 2009 Pay Raise (GS Population)	167			
3. Annualized FY 2009 Pay Raise (Core Comp Population)	866			
4. January 2010 Pay Raise (GS Population)	383			
5. January 2010 OSI (Core Comp Population)	1,721			
6. January 2010 SCI	361			
7. Non-pay inflation	1,184			
8. GSA Rent Increase	6,325			
Total Unavoidable Adjustments	**11,009**	**0**	**0**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. DOL Wage Determination Increases	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. Air Traffic Controller Hiring	0			
2. NextGen Staffing Increase	0			
3. UAS / Drug Inspector Staffing	0			
4. AVS Analytical Program Staff	0			
5. ASIAS Contract Support	0			
6. NextGen Environmental/Noise	0			
7. Congestion Studies	0			
8. National Security Systems Classified/ Controlled Information	0			
9. National Security Coordination Division/ Counter Intelligence	0			
10. Equal Employment Opportunity (EEO) and Civil Rights Programs	0			
11. FAA Privacy Program	0			
12. Automated Staffing and Processing (ASAP)	0			
13. Financial Systems Upgrades	0			
Total Discretionary Increases	**0**	**0**	**0**	**0**
Cost Efficiencies				
1. Rents, Utilities, and Leases	0			
2. Service Center Business Process Reengineering	0			
3. Administrative Overhead Efficiencies	0			
Total Cost Efficiencies	**0**	**0**	**0**	**0**
Base Transfers				
1. Air Traffic Controller Hiring Support	0			
2. Automated Staffing and Application Process (ASAP) System Enhancements	0			
3. Labor Relations Improvements	0			
4. Technical Library	0			
5. Office of Audit and Evaluation	0			
6. Panorama Business Views (PB Views)	-32			
7. Tech Ops Hiring	0			
8. Litigation Support	0			
9. Emergency Communications	0			
10. FAA Historian	0			
11. Clinical Psychologist	0			
12. Acquisition Support (AMQ) to Franchise Fund	0	-59		-59
Total Base Transfers	**-32**	**-59**	**0**	**-59**
FY 2010 Request	**341,977**	**780**	**29**	**822**

Detailed Justification for Staff Offices – ARC

Region and Center Operations (ARC)	FY 2010 Request: $341,977

Overview:

The Assistant Administrator for Region and Center Operations (ARC) serves as the Administrator's representative on all internal and external corporate matters within the nine regions and the Aeronautical Center. ARC determines and establishes regional organizational objectives and priorities and guides the development of and approves long-range plans; seeks opportunities to implement innovative ways to streamline administrative and operational processes to bring about efficiencies and to enhance productivity; and provides leadership for cross-organizational administrative and operational issues and projects such as NextGen. The Regional Administrators and Center Director serve as the senior agency aviation official in the regions/center, providing cross-functional oversight and integration for the agency, relations with industry, the public, and various governmental organizations, as well as leadership for lines of business support programs.

FY 2009 Program:

ARC is a multifaceted organization that supports each of the agency's four Flight Plan goal areas: increase safety, capacity, international leadership, and organizational excellence. ARC operates the Mike Monroney Aeronautical Center and the Center for Manager and Executive Leadership where technical, administrative, and management training is conducted for each discipline within the agency. ARC also operates the Logistics Center where supply support is accomplished to sustain the National Airspace System, as well as managing leases and real estate acquisition for establishing critical operational systems and services. In Headquarters, the Aviation Logistics Organization (ALO) leads and integrates logistics initiatives and real property initiatives in support of both the FAA and the Department of Transportation (DOT). The Administrator has established area integration offices under the auspices of the Regional Administrators in the Great Lakes and Eastern regions to ensure a corporate, coordinated approach is taken in both the O'Hare Modernization Program and the New York area initiatives. The Regional Administrators serve as the principal representative of the Administrator in an FAA region and provide leadership in cross-organizational matters, representing the Agency with industry, the public and governmental organizations. Regional Administrators ensure the delivery of high-quality corporate services including special programs; executive services; and command, control and communication operations. Each of these products and services is part of the vital support infrastructure needed to maintain strong, safe, and efficient national and international aviation systems.

FY 2009 Accomplishments

- Conduct the introductory resident training for all ATC new hires and follow-on courses at the FAA Academy consistent with the ATC Workforce Plan's increasing student numbers.
- Conduct financial operations and system support for the FAA, the DOT and other federal government agencies through the Enterprise Service Center.
- Deliver managerial, executive and technical training and related support services for the agency and other aviation organizations.
- Achieve a year-to-date average of less than 12 defects per 1,000 repaired assets through FY 2008 on exchange and repair of in-house assets.
- Operate Regional/Center Operations Centers (ROCs) that provide around-the-clock, immediate command, control and communications for all incidents related to NAS continuity.
- Identify excess real property assets that are candidates for disposal, termination, replacement, renovation or transfer.
- Improve the timeliness and accuracy of financial transactions related to asset capitalization, the management of suspense accounts and account reconciliation.
- Oversee and manage infrastructure operation and maintenance programs in Washington, D.C., regional office facilities, and the Mike Monroney Aeronautical Center.
- Serve as the agency focal point for the Chicago O'Hare International Airport Modernization

Program.

- Provide national leadership for the Air Tour Management Plan (ATMP) program and support environmental streamlining efforts and noise issues.
- Provide aviation safety services to the Federated States of Micronesia, the Republic of the Marshall Islands and the Republic of Palau.
- Enhance the safety, security, and capacity of aviation elements in the Russian Far East.
- Establish corporate managerial training programs that ensured resources are effectively used, aligned with agency goals and drove continuous improvement.
- Provide information technology services to ARC employees, other parts of the FAA, DOT, and other federal agencies.
- Enhance procurement, acquisition, and material management support by improving purchase card management and wireless device acquisition.
- Redesign selected managerial and executive training to build leadership competencies.
- Conduct instructor development training to prepare instructors to deliver Aviation English training and assessments to ICAO standards.
- Continue International Standards Organization (ISO) implementation with a goal of achieving ARC certifications by 2011.
- Under ARC leadership, the Airport Obstruction Standards Committee (AOSC) performs risk analysis in support of end-around taxiway approach procedures.

FY 2010 Budget Request:

For FY 2010, the Assistant Administrator for Regions and Center Operations requests $341,977,000 and 822 FTE to meet its mission, an increase of $10.9 million above the FY 2009 enacted level. This increase provides for basic pay raises and inflation for ARC base programs. The requested amount also reflects a transfer of $32,000 to the Assistant Administrator for Environmental Policy and Planning for agency-wide strategic planning.

The FAA Academy at the Mike Monroney Aeronautical Center in Oklahoma City continues to be the primary provider of technical, managerial, and executive training for the Agency and is the largest training facility within the Department of Transportation (DOT). The FAA Academy is recognized and respected worldwide as the premier aviation training institution, having served international students since 1946. The FAA Academy will continue to deliver managerial and executive training as well as technical training and related support services for the agency and other aviation organizations, both domestic and international. Through resident, field, web-based curriculum, high-fidelity simulators, computer-based instruction, interactive video teletraining, and correspondence study, the Academy exceeds 40,000 course completions annually affecting every element of the FAA's technical workforce, including:

- Aviation Safety Inspectors in the areas of Aircraft Operations, Airworthiness and Maintenance, and Aircraft Certification.
- Engineers, technicians, system/environmental specialists, and programmers responsible for NAS reliability and safety, which includes maintenance, repair, and training for over 40,000 pieces of equipment.
- Newly hired air traffic controllers who receive their initial training at the Academy using state-of-the-art classrooms and simulation systems. In 2008, the Academy conducted 113 air traffic controller precertification classes for 1,893 students.

The FAA Logistics Center, also located at the Aeronautical Center, is the primary provider for parts and logistics services in support of the National Airspace System (NAS). The FAA Logistics Center (FAALC) manages the central NAS inventory warehouses and distribution facilities for the FAA, providing routine and emergency logistics products and services to 8,000 FAA customers at 41,000 facilities and 28,000 sites, as well as to the Department of Defense (Air Force, Navy, and Army), state agencies and foreign countries. The Logistics Center provides core logistics support functions to the NAS, including:

- Supply chain management, including inventory management, for approximately 62,000 National Stock Numbers (NSNs), with an inventory value of approximately $760M.
- Centralized depot level overhaul, maintenance and repair of NAS Equipment, and on site overhaul

and maintenance for certain large systems such as towers and radar arrays.
- Storage and distribution management of NAS assets within a 725,000 sq. ft. centralized warehouse.
- Depot level engineering support.
- Agency focal point for Depot Level Integrated Logistics planning and implementation for NAS acquisition programs.

The agency is continuously seeking to improve its core logistics support functions such as reducing NAS asset delivery times and improving repair item quality. Business management improvements and cost efficiencies will be achieved by at the Aeronautical Center by replacing the primary automation system that supports FAALC service operations, the Logistics and Inventory System (LIS). Expanding and improving system capabilities and performance will reduce operating costs by right-sizing the agency's spares inventory, better managing depot throughput and increasing visibility into vendor and parts performance. The Logistics Center is taking the lead in applying 2D barcode technology to improve NAS asset visibility and tracking throughout the supply chain. By August 2009 the Logistics Center will implement full-scale 2D bar-coding capability within the Logistics Center. Life-cycle logistics support is critical to the efficient, effective and safe operation of the NAS. As the agency moves toward NextGen technology, a fully integrated logistics support approach is vital to ensure operational efficiency well into the future. During 2009, the iLOG Advisors Team will initiate key logistics support process improvements to include initial actions required for eventual integration of all FAA automated logistics support systems.

ARC also leads the Federal Real Property Asset Management initiative. ARC's Aviation Logistics Office maintains the Department-wide inventory of real property and the data and performance measures associated with approximately 67,300 buildings, structures, and land parcels. Federal real property is tracked in FAA's Real Estate Management System which also is the repository for DOT's entire real property inventory. Assets that are surplus, are not mission critical, are in poor condition, are under-utilized, and/or reflect high annual operation and maintenance costs should be considered candidates for disposition. To date, steady progress has been made in disposing of unneeded assets. The value of the FY 2007 disposed assets totaled more than $40,000,000. During FY 2008, FAA removed almost 2,500 assets valued at approximately $98,000,000 and thus far in FY 2009, FAA has removed approximately 700 assets valued at $14,000,000.

The FAA's ability to achieve and maintain an unqualified audit opinion is a critical factor in securing the agency's financial management credibility. ARC supports the annual audit process through continuous asset capitalization activities across the three Logistics Service Areas and within FAA's Aeronautical Center. Capitalization has been a historical area of concern, most recently identified by the Department of Transportation's Inspector General issuing a material weakness regarding capitalization timeliness and accuracy. In FY 2009 ARC implemented significant improvements to the capitalization process including an extensive quality assurance process which resulted in the successful processing of over 2,000 assets, the clean-up of an extensive backlog of prior year projects, and the removal of the materiel weakness. Asset processing is currently being performed with a 98% accuracy rate and additional process improvements are being implemented in FY 2009 to include the establishment of a $100K threshold for capitalized assets, standardized asset descriptions, and improved coordination through a National Capitalization Program Team.

DOT has developed the High Performance and Sustainable Buildings Implementation Plan to achieve the buildings design goals of Executive Order 13423, "Strengthening Federal Environmental, Energy, and Transportation Management" and building energy and water requirements of the Energy Independence and Security Act. A sustainable building practice has become a national priority. The Department and FAA are looking to significantly reduce the negative environmental effects of constructing, operating and maintaining buildings and the first step will be conducting an initial assessment to target buildings having the greatest opportunity to employ integrated design, optimize energy performance, protect and conserve water, enhance indoor air quality and reduce the environmental impacts of materials. An initial assessment will be conducted to identify the buildings most suitable for achieving compliance by 2015 for 15 percent of the existing buildings.

The Facilities Management staff provides administrative and operational support for FAA employees at headquarters and at the regional level, including the monitoring of all GSA space activities. At headquarters, guidance is provided on all space issues. Facilities Management oversees administrative telecommunications, personal property, motor vehicle management, and all building management activities including space and property management, nationwide rent program, parking, transit benefits, customer service desk, janitorial, building repairs, maintenance, design and construction, telecommunications management, national wireless program, building security, safety issues, and emergency evacuation plans. The goal is to provide efficient, multifaceted facilities management services that are innovative, environmentally responsive, and cost effective in support of the FAA's mission and goals. Approximately $135 million of the request funds administrative space leases for a broad range of agency facilities including Flight Standards District Offices, Aircraft Certification Offices, Manufacturing Inspection District Offices, Certificate Management Offices, Manufacturing Inspection Satellite Offices, and the agency's Regional Headquarters Offices located throughout the United States.

The Service Center leases for Seattle, Ft. Worth and Atlanta will expire between 2011 and 2013. Along with lease expirations, each Service Center has seen extensive growth due to the Air Traffic Organization realignment, mandated Flight Standards hiring, and Logistics support realignment. To accommodate the growth, additional satellite locations were acquired in each of the Service Centers. These additional locations increased lease costs, security costs, and IT infrastructure costs. To reduce these costs and improve overall efficiency, new Service Center facilities are being planned that would consolidate the satellite locations and the existing Service Center headquarters into three new facilities.

In FY 2008, management of FAA's Washington Flight Program (Hangar 6) transferred to ARC from the Air Traffic Organization (ATO). This program operates three jet aircraft (an FAA-owned Gulfstream G-IV and two leased Cessna Citations) housed at Ronald Reagan Washington National Airport's Hangar 6. Twenty FAA employees, including eight pilots, six maintenance technicians, and six support personnel, staff the facility. The aircraft are used for National Transportation Safety Board (NTSB) accident investigations, authorized training/currency flights for FAA headquarters personnel, transporting high-level DOT officials, and some Research and Development (R&D) projects. In addition, Hangar 6 supports eighteen different federal agencies through Memoranda of Agreement.

ARC will continue to chair the multidiscipline Airport Obstruction Standards Committee (AOSC) which serves as the vehicle to transform outdated, inconsistent obstruction standards practices to future policy that balances operational safety, effectiveness, and economic benefit. This committee develops coordinated standards and action plans for operational improvements such as runway-taxiway separation and end-around taxiways, and also works to enhance databases and data collection tools and models to improve airport flight operations. Successful capacity implementation projects require a strong commitment to integration, collaboration, accountability and a strategic vision from all stakeholders. ARC has a proven track record of successfully delivering complex and critical projects at both OEP airports and airports within major metropolitan areas. Under ARC's cross-agency management of the Runway Template Action Plan (RTAP) process, through the end of FY 2006 the FAA met OEP commissioning commitments on 11 new runways resulting in a system capacity increase of over 1.6 million annual operations. Regional Administrators have established regional Horizontal Integration Teams and cultivated relationships with key stakeholders at OEP airports and other metropolitan areas. ARC has repeatedly facilitated and resolved numerous critical issues that cut across multiple FAA organizations. The results have been increased levels of accountability, resource leveraging, communication and cooperation. ARC's lead role on new runway projects will focus limited agency resources on meeting key milestones needed to deliver full operational capability on these critical capacity improvement efforts. ARC has a proven track record with the advance planning, ongoing accountability and performance reviews required to meet new OEP runway capability commitments established in partnership with stakeholders. Use of the RTAP process continues to be a success, thus far yielding ten OEP runways delivered since 2001 with full operational capability on schedule.

ARC provides critical leadership and integration in implementing the agency's Capacity enhancing activities such as the Operational Evolution Partnership (OEP), the O'Hare Modernization Program (OMP) the Air Tour Management Program (ATMP) and the activities of the Airport Obstruction Standards Committee (AOSC). ARC provides regional leadership and integration for cross-organizational safety initiatives such as the Weather Cameras program. ARC works closely with the National Association of State Aviation Officials (NASAO), the Aircraft Owners and Pilots Association (AOPA), and other aviation interest groups to provide a continuous outreach program and to further Agency safety objectives and missions. The unique conditions of the Alaskan Region and its geographic neighbors has resulted in additional international leadership opportunities for the FAA, specifically in accomplishing international outreach on new technology; influencing the setting of international standards; developing transportation and communications infrastructure in the arctic circumpolar region; and providing training and technical assistance to the Russian

Far East area. ARC leadership ensures that the agency meets its commitment to provide aviation safety services to the Federated States of Micronesia and the Republic of the Marshall Islands as covered by the Compact of Free Association Act of 1985. Under a separate compact, ARC will provide support between the United States and the Republic of Palau to provide similar aviation safety services. ARC will also support the development of transportation and communications infrastructure in the Arctic Circumpolar region.

The Office of Acquisition Services, AMQ, provides acquisition and property management services in support of all MMAC activities and programs. The office acquires and administers supplies and services by contract, oversees the MMAC property system, and manages the purchase card program for Regions and Center Operations (ARC). In FY 2010, to improve financial management and metric based analysis of these services, AMQ will operate within the franchise fund environment. Customers receiving acquisition support from this group will benefit from the fee based arrangement that more accurately reflects service cost and will ultimately improve business quality. Realigning this activity will shift 59 positions from ARC direct appropriation to the Franchise Fund.

OPERATIONS APPROPRIATION

Information Services (AIO)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2009 Enacted (Omnibus)	**46,500**	**95**	**6**	**95**
FY 2009 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0	2		2
2. Annualized FY 2009 Pay Raise (GS Population)	0			
3. Annualized FY 2009 Pay Raise (Core Comp Population)	167			
4. January 2010 Pay Raise (GS Population)	0			
5. January 2010 OSI (Core Comp Population)	331			
6. January 2010 SCI	70			
7. Non-pay inflation	159			
8. GSA Rent Increase	0			
Total Unavoidable Adjustments	**727**	**2**	**0**	**2**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. DOL Wage Determination Increases	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. Air Traffic Controller Hiring	0			
2. NextGen Staffing Increase	0			
3. UAS / Drug Inspector Staffing	0			
4. AVS Analytical Program Staff	0			
5. ASIAS Contract Support	0			
6. NextGen Environmental/Noise	0			
7. Congestion Studies	0			
8. National Security Systems Classified/ Controlled Information	0			
9. National Security Coordination Division/ Counter Intelligence	0			
10. Equal Employment Opportunity (EEO) and Civil Rights Programs	0			
11. FAA Privacy Program	2,557	7		7
12. Automated Staffing and Processing (ASAP)	0			
13. Financial Systems Upgrades	0			
Total Discretionary Increases	**2,557**	**7**	**0**	**7**
Cost Efficiencies				
1. Rents, Utilities, and Leases	0			
2. Service Center Business Process Reengineering	0			
3. Administrative Overhead Efficiencies	0			
Total Cost Efficiencies	**0**	**0**	**0**	**0**
Base Transfers				
1. Air Traffic Controller Hiring Support	0			
2. Automated Staffing and Application Process (ASAP) System Enhancements	0			
3. Labor Relations Improvements	0			
4. Technical Library	0			
5. Office of Audit and Evaluation	0			
6. Panorama Business Views (PB Views)	-5			
7. Tech Ops Hiring	0			
8. Litigation Support	0			
9. Emergency Communications	0			
10. FAA Historian	0			
11. Clinical Psychologist	0			
12. Acquisition Support (AMQ) to Franchise Fund	0			
Total Base Transfers	**-5**	**0**	**0**	**0**
FY 2010 Request	**49,778**	**104**	**6**	**104**

Detailed Justification for Staff Offices – AIO

Information Services (AIO)	FY 2010 Request: $49,778

Overview:

The mission of the Office of Information Services and Chief Information Officer (AIO) is to improve managing the agency's more than $2 billion dollar investment in Information Technology (IT). AIO is also responsible for protecting FAA's critical information systems, networks, and administrative systems from cyber terrorism and malicious activities.

FY 2009 Program:

The FAA is responsible for providing a safe and efficient national aviation system. Within FAA, AIO has the primary responsibility to develop agency IT policy and strategy, to protect agency IT assets from cyber-attacks, to ensure alignment between IT investment and agency business needs, and to improve agency IT processes. The FAA spends more than $2.0 billion yearly on IT, the largest cost item after salaries and benefits.

Developed in concert with the agency's CIO Council and Information Systems Security Managers (ISSMs), AIO's FY 2009 Business Plan supports the FAA Flight Plan. Meeting the Business Plan targets and Flight Plan goals takes a collaborative effort from the lines of businesses and staff offices.

The FAA CIO ensures the integrity, confidentiality, and privacy of National Airspace (NAS) systems and information. CIO security related programs include Cyber Security, Privacy, IT and ISS security awareness and training, policy, standards and requirements, and system certification and compliance. The FAA CIO Cyber Security program ensures compliance with federal regulations, protection of the FAA's computer enterprise, and response to cyber incidents.

AIO has developed and maintains the Cyber Security Management Center (CSMC) to proactively meet the requirements of Homeland Security Directive 7 (HSPD-7), Federal Information Security Management Act (FISMA) and related regulations. CSMC is a partnership between the FAA CIO and FAA lines of business, with a focus on protecting our information technology (IT) infrastructure.

The FAA is responsible for preventing the unauthorized disclosure or loss of personally identifiable information (PII). In FY 2009 FAA experienced a large privacy breach potentially impacting over 45,000 FAA employees, and having an effect on employee trust in the Agency. Protection against privacy breaches is a critical part of the Office of IT Enterprise Service's mission. Programs that protect personal information must be accelerated and increased to prevent further breaches. The FAA has established an enterprise wide privacy program within the CIO to integrate security and privacy within the FAA culture and infrastructure, and to ensure full compliance with federal laws, including the Federal Information Security Act (FISMA). To meet the increasing prevalence of cyber threats, AIO is significantly increasing the number of personnel working on privacy issues and policy, and is implementing more robust software and hardware protections.

IT also funds four critical programs to improve response to and prevention of security incidents: Adaptive Quarantine, Software Reliability Engineering (SRE) and Software Fault Tolerance, Certification of High Integrity Systems, and Improved Security Metrics.

Anticipated FY 2009 Accomplishments:
Cyber Security

- Achieve zero cyber security events that significantly disable or degrade FAA service.
- Improve a Security Information Management (SIM) solution that will provide the CSMC greater situational awareness through real time processing of information systems security alerts.

Privacy

- Improve FAA Privacy Compliance Program implementation, testing and enforcement.

- Ensure that 100 percent of employees and contractors complete privacy security training.
- Ensure that any Privacy breach response is reported to and coordinated with the CSMC.
- Develop and implement PII data encryption protocols.
- Accelerate number of systems reviewed through NIST SP 100-26 Self-Assessments or SCAP process.

Certify IT Systems Inventory

- Complete certification and accreditation of FAA IT systems.
- Ensure that all operational and deployed systems on the IT systems inventory have completed current certification and authorization.
- Recertify 100 percent of the IT systems inventory scheduled for reassessment by September 30, 2009 (33 percent of the IT systems are re-certified in the three-year C&A cycle).
- Remediate 20 percent of high vulnerabilities as identified in the DOT portal with a completion date of FY 2009.

Security and Situational Awareness

- Train and develop FAA ISS professionals by ensuring that 95 percent of all employees and contractors complete ISS awareness training.

Electronic Government (E-Gov) Compliance

- Achieve satisfactory evaluation levels in the DOT and FISMA annual report.

Security Agreements

- Develop agreements with a major international air traffic management authority to share cyber-security technical and operational data, techniques, tactics, and procedures, and to work cooperatively towards better business practices.

Cost Reduction

- Achieve 90 percent of approved cost control savings and avoidance target with 10-15 percent reduction in savings on strategic sources and reduction of overhead costs by 5-10 percent

Enterprise Architecture (EA) Conformance

- Continue to enhance the FAA's enterprise architecture and solutions architecture to ensure that the Administrative, NAS support and NAS architecture are compatible and meet future requirements.
- Provide core capabilities, support and business solutions to FAA Lines of Business (LOBs) through corporate IT specifications, standards, and requirements.
- Develop and maintain information architecture to seamlessly share information between agencies participating in the Next Generation Air Transportation System.
- Continue to transition the FAA's Backbone Infrastructure to an Internet Protocol version 6 (IPv6) compatible configuration and ensure that the agency's networks interface with this infrastructure.
- Continue to develop plans to integrate network connections from lines of business into the IPv6 compliant backbone, applications and systems.
- Continue IPv6 integration with other government initiatives, including Trusted Internet Connections (TIC), Federal Desktop Core Configuration (FDCC), and Homeland Security Presidential Directive-12 (HSPD-12).

Business Process Improvement

- Improve processes that are critical to performing FAA mission, business functions, and acquisition programs; integrate EA with acquisitions, software development lifecycle and configuration management processes.
- Improve processes and capabilities critical to the acquisition, maintenance and operations of systems associated with NAS and NAS modernization plans and development of IT products and services.
- Provide enterprise-wide leadership for information assurance and IT strategy, governance, innovation, financial discipline, and service delivery.

FY 2010 Budget Request:

For FY 2010, the Assistant Administrator for Information Services and Chief Information Officer (AIO) requests $49,778,000 and 104 FTE to meet its mission. This increase will provide for pay raises and inflation. The request also provides $2.557 million for the FAA Privacy Program. The 2010 request supports the following activities:

Privacy

Following a large privacy breach in February 2009, FAA began to accelerate its Privacy Program, adding additional tasks and resources to prevent future large privacy breaches of personal data about employees or the customers served by the FAA (including pilots).

New software tools designed to discover, intercept, and warn the agency when unauthorized PII information is being stored or transmitted without proper oversight were purchased in FY2009. Starting in FY 2010 funds cover ongoing maintenance for existing software tools and licenses. FAA will also purchase six specialized software/hardware devices to secure access to the Internet through internet access points.

Seven additional FTEs planned for FY2010 support the Privacy work including responding to Privacy Act requests, training and awareness of all employees and contractors, and policy and procedure development as they pertain to OMB mandates, including the mandate to eliminate all unnecessary uses of Social Security Numbers.

FY2010 funds support consulting service procurements to assist with the required process re-engineering needed as FAA changes how it collects, stores, transmits and destroys PII data throughout the entire agency.

FY 2010 activities align FAA Privacy Policy with FAA business processes to ensure that resources are properly allocated, and that enterprise-wide policy, standards and guidance to support the implementation of privacy solutions are developed and implemented. FAA will:

- Ensure that 98 percent of employees and contractors are current in privacy security training.
- Continue and improve Privacy breach response and coordination with the CSMC.
- Ensure 100 percent compliance and enforcement of PII data encryption protocols, with encryption of all PII data at rest or in transit.
- Ensure that 100 percent of systems reviewed through NIST SP 100-26 Self-Assessments or SCAP processes are completed or are on schedule for completion.
- Ensure that 100 percent of systems have documented and tested Risk Assessments for all medium and high-risk PII systems as part of the SCAP process.
- Mitigate program weaknesses within planned timelines (Baseline and move towards 100 percent for improved planning timelines.)
- Ensure that 90 percent of PII systems that use Social Security Numbers (SSNs) have proper authority to do so, and that 90 percent of PII systems reduce or eliminate unnecessary use of SSNs.
- Purchase and install six Internet Protocol System (IPS) appliances to secure the Internal Access Points.

Information System Security (ISS)

Ensure that all FAA information systems identify and provide information security protection equal to the risk and magnitude of the harm resulting from unauthorized access, use, disclosure, modification or disclosure of information that supports the agency, aviation safety and security, and the NAS.

This program directly supports the FY 2009-2013 FAA Flight Plan, Organizational Excellence Goal, Objective 3, and Performance Target: Achieve zero cyber security events that disable or significantly degrade FAA service. Without sufficient funding in this area, FAA is in danger of not meeting its goal of zero cyber security events that disable or significantly degrade FAA services. The sharp increase in "Special Threat" events and the number of alerts is proof that FAA is becoming more of a target.

Special Threat events are targeted attacks on federal government systems that pose a serious and imminent threat to those systems. These are events specific in nature, objective and patterned, and by design are hostile in intent. To date FAA has had 81 such attacks. Understanding all aspects of these events dictates that they be detected and prevented to the maximum extent to which the target (in this case FAA or other agencies) is capable. The development of the term "Special Threat" was initiated as an indirect route to allow the communication of these events, and the identification and mitigation of systems that have been compromised or affected by these sophisticated attacks.

Cyber Security
Achieve zero cyber security events that significantly disable or degrade FAA service.

- Enhance NAS architecture to include cyber security, harden individual NAS systems and networking elements, improve recovery rate times, and enhance boundary protection by completing remediation of vulnerabilities, improved information sharing, and systemic monitoring of systems.
- Examine, prioritize, and remediate vulnerabilities as identified in the DOT portal.

Certify IT Systems Inventory
FAA policy stipulates that all information systems must be recertified every three years. The FAA has 288 legacy information systems that need to be certified and authorized as secure. The Certification and Authorization (C&A) process addresses all threats and documents the actions needed to address any vulnerability. In FY 2010, 90 systems require recertification. The FAA will conduct and implement the C&A process according to National Institute of Standards and Technology standards. The FAA will conduct compliance verification at the regional headquarters as well as NAS facilities.

The inability to complete re-certifications would severely jeopardize the flight plan goal of zero cyber events. Several of these systems, *High* and *Moderate* vulnerabilities are in mission critical NAS systems, critical Aviation Safety (AVS) and medical applications, and essential business and security systems. The obligation to complete these re-certifications is a FISMA requirement. All overdue re-certifications are identified and tracked by the DOT CIO.

- Complete certification and accreditation and ongoing Self Assessments all FAA IT systems.
- Ensure that all operational and deployed systems on the IT systems inventory have completed current certification and authorization.
- Recertify 100 percent of the IT systems inventory scheduled for reassessment by September 30, 2009 (33 percent of the IT systems are re certified in the three-year C&A cycle.)
- Remediate, or continue to meet timelines for remediation for 100 percent of high vulnerabilities as identified in the DOT portal with a completion date of FY 2010.

Security and Situational Awareness
The Computer Security Act requires all federal employees to receive security training. The FAA must provide general and specialized security training to its more than 100,000 Federal employees and contractors who work in the information security field as well as those who have day-to-day use and access to FAA systems. Specialized information systems security training is also important to raise the security proficiency of employees responsible for identifying and fixing system vulnerabilities. The FY 2010 funding will pay for the specialized training of key FAA information systems security personnel as well as generalized security awareness training for all FAA employees.

Funding is also requested to enable the agency to comply with HSPD-7 and HSPD-12, and meet its flight plan goal to defend FAA's NAS information systems and networks against increased cyber terrorism and malicious activities by hackers and other unauthorized personnel.

- Build situational awareness by expanding the reach of the CSMC security architecture through new or improved placement of security toolset devices and applications.
- Increase wireless IDS across the enterprise by establishing wireless IDS in Terminal Radar Approach Control facilities (TRACONS)
- Update and improve Security Awareness training to ensure effective training outcomes.
- Train and develop FAA ISS professionals by ensuring that 95 percent of all employees and contractors complete ISS awareness training.

Security Agreements

- Continue to develop international agreements and memoranda of cooperation with major international air traffic management authorities to share cyber-security technical and operational data, techniques, tactics, and procedures, and to work cooperatively towards better business practices.

E-Gov Compliance
The main objective under the e-Gov goal is to assure that critical electronic services and information

delivered to the users (the air traffic controllers, airline pilots, and the public) are valid and efficiently delivered. This will be accomplished through continued improvement of service delivery capabilities and development of project portfolios aimed at the key customer groups, as well as projects dedicated to improving internal efficiency and effectiveness. Specific e-Gov initiatives include EA and IT capital planning, continued agency participation in the Quicksilver program, and continued implementation of consolidated enterprise IT services.

- Continue to ensure that IT serves as a strategic enabler for the agency, providing secure and efficient capabilities to store and exchange the agency's critical information.
- Maintain satisfactory evaluation levels in the DOT and FISMA annual report.

Cost Reduction
Develop, track, and report quarterly on a comprehensive measure of its operating efficiency or financial performance. These measures will include: Cost per flight controlled, Research, Engineering, and Development (RE&D) Management Staff Efficiency Measure, Grant Administration Efficiency Measure, Direct labor costs of certification of foreign and domestic repair stations, Direct labor costs of surveillance of foreign and domestic repair stations.

- Annual reduction of $15 million in Information Technology operating costs.
- Reduce overhead costs 5-10 percent through automation of invoice processing.
- Achieve 10-15 percent savings for strategic sourcing for selected products and services.
- Continue to consolidate computer servers to improve security and reduce costs.
- Integrate Budget Planning and Program Planning to reduce costs and increase an Earned Value Management (EVM) approach to program management.

Enterprise Architecture (EA) Conformance
Provide support and business solutions to Lines of Business through the corporate FAA Technical Reference Manual (TRM), including IT specifications, standards, and requirements. Ensure that business solutions conform to requirements and regulations as measured against NIST directives.

- Continue to enhance FAA's enterprise architecture and solutions architecture to ensure that the Administrative, NAS support and NAS architecture are compatible and meet future requirements.
- Provide core capabilities, support and business solutions to FAA LOBs through corporate IT specifications, standards, and requirements.
- Develop and maintain information architecture to seamlessly share information between agencies participating in the Next Generation Air Transportation System.
- Continue to transition FAA's Backbone Infrastructure to an Internet Protocol version 6 (IPv6) compatible configuration and ensure that the agency's networks interface with this infrastructure.
- Continue to Integrate IPv6 into the FAA's Information Resources Management strategic plan and modify FAA's Acquisition Management System (AMS) policy to include language requiring IPv6 compatibility in future networking procurements.
- Develop and implement plans to integrate network connections from LOBs into the IPv6 compliant backbone, applications and systems.
- Continue Internet Protocol version 6 (IPv6) integration with other government initiatives, including TIC, FDCC, and HSPD-12.

Business Process Improvement

- Improve processes that are critical to performing FAA mission, business functions, and acquisition programs; integrate EA with acquisitions, software development lifecycle and configuration management processes.
- Improve processes and capabilities critical to the acquisition, maintenance and operations of systems associated with NAS and NAS modernization plans and development of IT products and services.
- Coordinate with LOBs and the NAS staff on development of enterprise-wide processes, solutions, and segment architectures where there are common requirements.

OPERATIONS APPROPRIATION

Office of the Administrator (AOA)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2009 Enacted (Omnibus)	**4,622**	**24**	**4**	**28**
FY 2009 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0			
2. Annualized FY 2009 Pay Raise (GS Population)	14			
3. Annualized FY 2009 Pay Raise (Core Comp Population)	28			
4. January 2010 Pay Raise (GS Population)	32			
5. January 2010 OSI (Core Comp Population)	56			
6. January 2010 SCI	12			
7. Non-pay inflation	3			
8. GSA Rent Increase	0			
Total Unavoidable Adjustments	**145**	**0**	**0**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. DOL Wage Determination Increases	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. Air Traffic Controller Hiring	0			
2. NextGen Staffing Increase	0			
3. UAS / Drug Inspector Staffing	0			
4. AVS Analytical Program Staff	0			
5. ASIAS Contract Support	0			
6. NextGen Environmental/Noise	0			
7. Congestion Studies	0			
8. National Security Systems Classified/ Controlled Information	0			
9. National Security Coordination Division/ Counter Intelligence	0			
10. Equal Employment Opportunity (EEO) and Civil Rights Programs	0			
11. FAA Privacy Program	0			
12. Automated Staffing and Processing (ASAP)	0			
13. Financial Systems Upgrades	0			
Total Discretionary Increases	**0**	**0**	**0**	**0**
Cost Efficiencies				
1. Rents, Utilities, and Leases	0			
2. Service Center Business Process Reengineering	0			
3. Administrative Overhead Efficiencies	0			
Total Cost Efficiencies	**0**	**0**	**0**	**0**
Base Transfers				
1. Air Traffic Controller Hiring Support	0			
2. Automated Staffing and Application Process (ASAP) System Enhancements	0			
3. Labor Relations Improvements	0			
4. Technical Library	0			
5. Office of Audit and Evaluation	-562	-4		-4
6. Panorama Business Views (PB Views)	0			
7. Tech Ops Hiring	0			
8. Litigation Support	0			
9. Emergency Communications	0			
10. FAA Historian	0			
11. Clinical Psychologist	0			
12. Acquisition Support (AMQ) to Franchise Fund	0			
Total Base Transfers	**-562**	**-4**	**0**	**-4**
FY 2010 Request	**4,205**	**20**	**4**	**24**

Detailed Justification for Staff Offices – AOA

Office of the Administrator (AOA)	FY 2010 Request: $4,205

Overview:

The office of the Administrator and Deputy Administrator leads the agency, with a vision to continuously improve the safety and efficiency of aviation, while being responsive to customers and accountable to the public.

FY 2009 Program:

In leading FAA, the Administrator oversees its employees in maintaining, operating, and overseeing the largest and most complex aviation system in the world—a system with a safety record that surpasses all others. The agency determines the regulatory and operational standards for the United States, and effectively sets the benchmark for aviation safety around the world.

Goals include:

Increased Safety – achieving the lowest possible accident rate and to constantly improve safety; reducing the number of fatal accidents in General Aviation; and enhancing the safety of FAA's air traffic systems.

Greater Capacity – working with local governments and airspace users to provide increased capacity in the U.S. airspace system that meets projected demand in an environmentally sound manner.

International Leadership – increasing the safety and capacity of the global civil aerospace system in an environmentally sound manner.

Organizational Excellence – ensuring the success of FAA's mission through stronger leadership, a better trained workforce, enhanced cost-control measures, and improved decision-making based on reliable data.

Anticipated FY 2009 Accomplishments:

- Reduce the commercial airline fatal accident rate.
- Reduce the number of fatal accidents in general aviation.
- Enhance the safety of FAA's air traffic systems.
- Increase airport capacity to meet projected demand and reduce congestion.
- Make air traffic flow over land and sea more efficient.
- Promote improved safety and regulatory oversight in cooperation with bilateral, regional, and multilateral aviation partners.
- Make FAA more effective with stronger leadership, increased commitment of individual workers to full organization-wide goals, and a better prepared, better trained, and diverse workforce.
- Improve financial management while delivering quality customer service.
- Enhance our ability to respond to crisis rapidly and effectively, including security-related threats and natural disasters.
- Continue to accelerate the modernization of the national airspace system.

FY 2010 Budget Request:

In FY 2010, the Administrator's office requests $4,205,000 and 24 FTE to meet its mission, a net reduction of $417,000 below the FY 2009 enacted level. This net reduction consists of an increase of $145,000 for basic pay raises and inflation and $562,000 in base transfer funding to the Office of the Chief Counsel to establish the Office of Audit and Evaluation. Throughout FY 2010, AOA will continue to lead FAA toward achieving the agency's performance goals and targets.

OPERATIONS APPROPRIATION

Civil Rights (ACR)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2009 Enacted (Omnibus)	**9,958**	**74**	**4**	**78**
FY 2009 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0			
2. Annualized FY 2009 Pay Raise (GS Population)	3			
3. Annualized FY 2009 Pay Raise (Core Comp Population)	91			
4. January 2010 Pay Raise (GS Population)	6			
5. January 2010 OSI (Core Comp Population)	181			
6. January 2010 SCI	38			
7. Non-pay inflation	8			
8. GSA Rent Increase	0			
Total Unavoidable Adjustments	**328**	**0**	**0**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. DOL Wage Determination Increases	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. Air Traffic Controller Hiring	0			
2. NextGen Staffing Increase	0			
3. UAS / Drug Inspector Staffing	0			
4. AVS Analytical Program Staff	0			
5. ASIAS Contract Support	0			
6. NextGen Environmental/Noise	0			
7. Congestion Studies	0			
8. National Security Systems Classified/ Controlled Information	0			
9. National Security Coordination Division/ Counter Intelligence	0			
10. Equal Employment Opportunity (EEO) and Civil Rights Programs	692	7		7
11. FAA Privacy Program	0			
12. Automated Staffing and Processing (ASAP)	0			
13. Financial Systems Upgrades	0			
Total Discretionary Increases	**692**	**7**	**0**	**7**
Cost Efficiencies				
1. Rents, Utilities, and Leases	0			
2. Service Center Business Process Reengineering	0			
3. Administrative Overhead Efficiencies	0			
Total Cost Efficiencies	**0**	**0**	**0**	**0**
Base Transfers				
1. Air Traffic Controller Hiring Support	0			
2. Automated Staffing and Application Process (ASAP) System Enhancements	0			
3. Labor Relations Improvements	0			
4. Technical Library	0			
5. Office of Audit and Evaluation	0			
6. Panorama Business Views (PB Views)	-1			
7. Tech Ops Hiring	0			
8. Litigation Support	0			
9. Emergency Communications	0			
10. FAA Historian	0			
11. Clinical Psychologist	0			
12. Acquisition Support (AMQ) to Franchise Fund	0			
Total Base Transfers	**-1**	**0**	**0**	**0**
FY 2010 Request	**10,977**	**81**	**4**	**85**

Detailed Justification for Staff Offices — ACR

Civil Rights (ACR)	FY 2010 Request: $10,977

Overview:

The Office of Civil Rights (ACR) is committed to maintaining a model Equal Employment Opportunity (EEO) program throughout FAA in accordance with the EEO Commission Management Directive 715. ACR also provides leadership and direction in support of external program initiatives to increase Disadvantaged Business Enterprise (DBE) participation, Americans with Disabilities Act (ADA), and Title VI (prohibition of discrimination) compliance.

FY 2009 Base:

FAA employees maintain, operate and oversee the largest and most complex aviation system in the world, with a safety record that is second to none.

Equal opportunity in the federal workplace is critical to accomplishing this goal. It requires leadership, integration of EEO into the agency's strategic mission, management and program accountability, proactive prevention of unlawful discrimination, efficiency and responsiveness, and legal compliance to EEO mandates. The FAA federally-operated and assisted transportation programs must also ensure equal opportunity for all beneficiaries and potential beneficiaries of our programs.

ACR's performance goals focus on the strategic goal areas of Organizational Excellence and Capacity. Within the goal of Organizational Excellence, ACR will ensure that FAA maintains a Model EEO Program as required by the EEOC Management Directive on Equal Employment Opportunity. Within the goal of Capacity, ACR provided technical assistance as well as review and approve airport plans for fostering participation in the construction and concession arena by businesses owned by disadvantaged persons.

Anticipated FY 2009 Accomplishments:

- Ensure equal opportunity for all beneficiaries and potential beneficiaries in federally operated and assisted aviation transportation programs by managing the DBE program and investigating equal access complaints against grantees under the Airport Improvement Program (AIP).
- Support airport sponsors and DBEs by conducting consultations, training and briefings on the DBE program, ADA, Title VI, Limited English Proficiency (LEP) and other civil rights regulations so that the aviation community is aware of civil rights requirements.
- Ensure airport compliance with ADA, Title VI, LEP, and other civil rights regulations by providing technical assistance to stakeholders, monitoring airport efforts and assessing complaints, measured by processing and reviewing 100 percent of complaints received in a timely manner.
- Review plans developed by airport grant recipients to ensure equal opportunities for DBE participation in AIP contracting and concession projects. The measure of success is ensuring 100 percent approvals of DBE goal methodologies that have been submitted with all appropriate information.
- Support a timely and effective corporate approach to conflict management by providing support to the Center for Early Dispute Resolution (CEDR) in order to resolve conflicts before they enter an established process.
- Support the CIO and delegated offices of primary interest (OPI) efforts to improve protection for FAA's information infrastructure.
- Manage the EEO Counselor Program by maintaining an adequate active pool of counselors to process 100 percent of the pre-complaints by conducting basic and advanced EEO counseling training, as needed, to ensure a sufficient number of well-trained counselors to process 100

percent of the pre-complaints.

- Manage the EEO Mediation Program by maintaining an adequate active pool of mediators to process 100 percent of the requests for mediation by conducting basic and refresher EEO mediation training, as needed, to ensure a sufficient number of well-trained mediators to process 100 percent of the requests for mediation.
- Provide policy guidance, technical assistance and direct intervention to the lines of business and staff offices to assist them to resolve EEO complaints.
- Increase managerial and employee awareness with regard to EEO responsibilities and appropriate behaviors by conducting ten briefings for managers and employees per quarter.
- Conduct EEO recognition process for the FAA Administrator. Prevention includes recognizing significant contributions towards creating a Model EEO Program and reinforcing positive behavior in support of equal opportunity.
- Manage the National Federal Women's Program, National Hispanic Employment Program and the People with Disabilities Program that were created for the purpose of ensuring equal opportunity.
- Oversee the MD-715 Process for developing the annual EEO plan and monitoring agency accomplishments.
- Conduct ten on-site surveys to determine the extent to which facilities are maintaining a Model EEO Program under MD-715.
- Implement additional actions to enhance customer satisfaction with services provided by ACR.
- Work in collaboration with the Aviation and Space Education (AVSED) outreach programs and support AVSED by providing staff assistance.
- Ensure strong leadership and a well-trained, efficient ACR workforce.
- Evaluate each non-supervisory specialist vacancy as an opportunity to hire at the entry level, provided hiring at the lower level does not reduce required customer services, jeopardize MD-715 compliance, or diminish ACR's ability to accomplish activities under the Organizational Excellence Flight Plan goal.
- The ACR management team will support FAA's corporate focus on improving future Employee Attitude Survey results in the areas of communication and performance rewards and recognition.

FY 2010 Budget Request:

For FY 2010, the Assistant Administrator for Civil Rights requests $10,977,000 and 85 FTE to meet its mission, an increase of $1.0 million and seven FTE above the FY 2009 enacted level. This increase provides for pay raises and inflation for ACR base programs, as well as an increase of $692,000 for Equal Employment Opportunity and Civil Rights Programs. The requested amount also reflects a transfer of $1,000 to the Assistant Administrator for Environmental Policy and Planning for agency-wide strategic planning. The following Core activities represent the FY 2010 budget request:

- Ensure compliance with DBE policy and regulations at airports.
- Adjudicate external complaints from the public and other customers.
- Partner with the Airport Minority Advisory Council (AMAC) to conduct the third largest aviation training conference and partner with other organizations to conduct DBE training and provide technical assistance and consultations.
- Ensure compliance with ADA and Section 504 policy and regulations at airports.
- Manage and ensure compliance with Title VI, Limited English Proficiency (LEP), Environmental Justice (EJ) and other civil rights policy and regulations at airports
- Adjudicate external complaints from the public and other customers.
- Develop and implement Corporate and LOB/SO Organizational Excellence Action Plans that address employee feedback and engagement, and improve organizational effectiveness, accountability and performance.
- ACR will publicize the people with disabilities contract for recruiting, hiring, and placing people with targeted disabilities.
- Improve the timeliness of processing EEO pre-complaints unless the employee agrees to an

extension or alternative dispute resolution is engaged.

- Ensure airport compliance with the American Disabilities Act.
- Standardize ACR websites making them more useful for exchanging information and conducting business.
- Implement corporate strategies that expand the applicant pool to ensure equal opportunity to all applicants and result in attracting high quality candidates to the FAA.
- Oversee the process for developing the Annual MD-715 EEO Plan and Monitoring Agency Accomplishments.
- Manage the National Federal Women's Program, Hispanic Employment Program and the People with Disabilities Program to ensure equal opportunity.
- Ensure strong leadership and a well-trained, efficient workforce to enhance ACR's ability to provide a full complement of EEO services for customers as well as increase the efficiency of ACR services through the use of information technology.
- Ensure an EEO discrimination process that can process 100% of the allegations and inquiries regarding EEO complaints by having adequate counseling, mediation and consulting services.
- Manage the FAA EEO Formal Complaint Process and ensure that the formal EEO Complaint process is administered in accordance to policy and regulations by reviewing reports of investigations, providing consultation, and overseeing the alternative dispute resolution process.
- Manage outreach initiatives to ensure equal opportunity.
- Provide leadership, policy and direction on EEO to the agency in the area of the alternate dispute resolution program and through EEO evaluations.

OPERATIONS APPROPRIATION

Government & Industry Affairs (AGI)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2009 Enacted (Omnibus)	**1,539**	**12**	**0**	**12**
FY 2009 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0			
2. Annualized FY 2009 Pay Raise (GS Population)	0			
3. Annualized FY 2009 Pay Raise (Core Comp Population)	17			
4. January 2010 Pay Raise (GS Population)	0			
5. January 2010 OSI (Core Comp Population)	33			
6. January 2010 SCI	7			
7. Non-pay inflation	0			
8. GSA Rent Increase	0			
Total Unavoidable Adjustments	**57**	**0**	**0**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. DOL Wage Determination Increases	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. Air Traffic Controller Hiring	0			
2. NextGen Staffing Increase	0			
3. UAS / Drug Inspector Staffing	0			
4. AVS Analytical Program Staff	0			
5. ASIAS Contract Support	0			
6. NextGen Environmental/Noise	0			
7. Congestion Studies	0			
8. National Security Systems Classified/ Controlled Information	0			
9. National Security Coordination Division/ Counter Intelligence	0			
10. Equal Employment Opportunity (EEO) and Civil Rights Programs	0			
11. FAA Privacy Program	0			
12. Automated Staffing and Processing (ASAP)	0			
13. Financial Systems Upgrades	0			
Total Discretionary Increases	**0**	**0**	**0**	**0**
Cost Efficiencies				
1. Rents, Utilities, and Leases	0			
2. Service Center Business Process Reengineering	0			
3. Administrative Overhead Efficiencies	0			
Total Cost Efficiencies	**0**	**0**	**0**	**0**
Base Transfers				
1. Air Traffic Controller Hiring Support	0			
2. Automated Staffing and Application Process (ASAP) System Enhancements	0			
3. Labor Relations Improvements	0			
4. Technical Library	0			
5. Office of Audit and Evaluation	0			
6. Panorama Business Views (PB Views)	0			
7. Tech Ops Hiring	0			
8. Litigation Support	0			
9. Emergency Communications	0			
10. FAA Historian	0			
11. Clinical Psychologist	0			
12. Acquisition Support (AMQ) to Franchise Fund	0			
Total Base Transfers	**0**	**0**	**0**	**0**
FY 2010 Request	**1,596**	**12**	**0**	**12**

Detailed Justification for Staff Offices – AGI

Government & Industry Affairs (AGI)	FY 2010 Request: $1,596

Overview:

The Office of Government and Industry Affairs (AGI) serves as the administrator's principal adviser and representative on matters concerning relationships with the Congress, aviation industry groups, and other governmental organizations. In concert with other agency organizations, AGI develops and reviews various plans and strategies involving these groups enhancing the promotion of aviation safety. These activities are conducted in close coordination and consultation with the Assistant Secretary for Governmental Affairs.

FY 2009 Program:

AGI represents the first impression and indeed, sometimes the only contact members of Congress and their staffs have with FAA. This customer-oriented office, small by comparison to most other FAA organizations, works directly for the Administrator and is the principal linkage between the agency and the legislative branch of government.

AGI works with other staff organizations to coordinate and present FAA's legislative message. AGI works with other organizations within FAA to facilitate their relations with Congress. AGI consistently monitors and gauges the interest and needs of the Members and leadership on Capitol Hill. This relationship also extends to coordinating our legislative initiatives and responses with the Department of Transportation.

This vigorous outreach is not limited to Congress. AGI also serves as liaison with the aviation industry, from manufacturers to carriers, and with other aviation related organizations. Additionally, AGI serves as the principal point of contact for state and local governments.

Anticipated FY 2009 Accomplishments:

- Participate in weekly meetings with Lines of Businesses (LOB) and Staff Offices (SO) to discuss and stay current on major safety policies, initiatives, and significant rulemaking activities.
- Provided appropriate and timely notification of all major notices to congressional members and their staff before it becomes public.
- Research legislation to determine directed actions from Congress to identify reports to be completed by FAA.
- Determine and assign the appropriate FAA organization responsible for compiling reports to congress.
- Develop and assign LOB and SO report timelines to ensure due dates are met.
- Review and edit draft reports, facilitate agency and departmental coordination, and forward final reports to the Office of the Administrator (AOA) for review and approval.
- Facilitate, coordinate and participate in all congressional briefings on major policy, safety initiatives, rulemaking, and other issues of concern, some of which are regularly scheduled by AGI. AGI's role is to foster a better understanding of the agency's policies and programs by members of congress and their staff, and afford them the opportunity to interact directly with key FAA policy and decision-making officials. This proactive approach also enhances congressional Members and their staffs' confidence in the agency's policies and programs.
- Continue to maintain and improve daily communications with OST Government Affairs.
- Provide daily activity reports on congressional contacts to AGI management officials.
- Provide weekly congressional activities report to the Administrator and senior DOT officials.
- Provide congressional activities input for inclusion in the Administrator's weekly White House Report.

FY 2010 Budget Request:

For FY 2010, the Assistant Administrator for Government and Industry Affairs requests $1,596,000 and 12 FTE to meet its mission, an increase of $57,000 above the FY 2009 enacted level. This increase provides for pay raises and inflation for AGI base programs. The following core activities represent the FY 2010 budget request:

- Communicate to Congress on behalf of the Administrator and management board.
- Enhance AGI's daily interaction with LOB and SO, and senior management officials by proactively soliciting LOB and SO information sharing in order to improve communication on areas of interest or concern to congress.
- Inform key members of Congress and their staff on FAA safety policies and initiatives.
- Manage the Reports to Congress program, and function as the agency's Report to Congress liaison with congressional authorizing and appropriations staffs to clarify definitions of congressional intent. Also manage the coordination process between FAA, OST, and OMB, and encourage timely LOB and SO responses to targeted deadlines.
- Assist in preparing agency officials for congressional meetings and briefings.
- Provide OST Governmental Affairs with factual, concise, and complete information from significant AGI congressional contacts and activities.
- Serve as focal point for congressional follow-up on written agency responses.
- Foster strong partnerships with key industry stakeholders.
- Meet with aviation industry representatives to strengthen industry relationships.
- Communicate the administration's position on key aviation issues.

OPERATIONS APPROPRIATION

Communications (AOC)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2009 Enacted (Omnibus)	**6,699**	**34**	**1**	**34**
FY 2009 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0			
2. Annualized FY 2009 Pay Raise (GS Population)	20			
3. Annualized FY 2009 Pay Raise (Core Comp Population)	37			
4. January 2010 Pay Raise (GS Population)	46			
5. January 2010 OSI (Core Comp Population)	73			
6. January 2010 SCI	15			
7. Non-pay inflation	7			
8. GSA Rent Increase	0			
Total Unavoidable Adjustments	**198**	**0**	**0**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. DOL Wage Determination Increases	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. Air Traffic Controller Hiring	0			
2. NextGen Staffing Increase	0			
3. UAS / Drug Inspector Staffing	0			
4. AVS Analytical Program Staff	0			
5. ASIAS Contract Support	0			
6. NextGen Environmental/Noise	0			
7. Congestion Studies	0			
8. National Security Systems Classified/ Controlled Information	0			
9. National Security Coordination Division/ Counter Intelligence	0			
10. Equal Employment Opportunity (EEO) and Civil Rights Programs	0			
11. FAA Privacy Program	0			
12. Automated Staffing and Processing (ASAP)	0			
13. Financial Systems Upgrades	0			
Total Discretionary Increases	**0**	**0**	**0**	**0**
Cost Efficiencies				
1. Rents, Utilities, and Leases	0			
2. Service Center Business Process Reengineering	0			
3. Administrative Overhead Efficiencies	0			
Total Cost Efficiencies	**0**	**0**	**0**	**0**
Base Transfers				
1. Air Traffic Controller Hiring Support	0			
2. Automated Staffing and Application Process (ASAP) System Enhancements	0			
3. Labor Relations Improvements	0			
4. Technical Library	0			
5. Office of Audit and Evaluation	0			
6. Panorama Business Views (PB Views)	-5			
7. Tech Ops Hiring	0			
8. Litigation Support	0			
9. Emergency Communications	0			
10. FAA Historian	0			
11. Clinical Psychologist	0			
12. Acquisition Support (AMQ) to Franchise Fund	0			
Total Base Transfers	**-5**	**0**	**0**	**0**
FY 2010 Request	**6,892**	**34**	**1**	**34**

Detailed Justification for Staff Offices – AOC

Communications (AOC)	**FY 2010 Request: $6,892**

Overview:

The Office of Communications (AOC) serves as the focal point for news media inquiries, speaking for the FAA and initiating both internal and external communication programs covering the breadth of FAA issues. The office provides advice to the Administrator, Deputy Administrator, and Associate/Assistant Administrators on communication strategy and products, and prepares senior FAA officials to take part in media interviews and other public appearances. The office also manages the FAA's internal and external websites. Regional offices are maintained in eight locations to provide the same services to FAA leadership in the regions in support of public affairs work and national leadership. AOC supports internal FAA communications through various web-based publications, video and audio.

FY 2009 Program:

AOC works with the news media to provide the public with accurate, timely, useful and important information about the agency's goals, policies, activities and operations. As part of that mission, AOC actively promotes FAA activities that deal with Safety, Capacity, International Leadership and Organizational Excellence.

In addition, AOC serves as the internal voice of FAA, providing staff and employees with daily, weekly, and periodic communication tools and news programs. AOC manages the FAA's internal and external web content, as well as the national branding program, and provides graphic design, printing and media (broadcast and video) services to the agency at large.

Anticipated FY 2009 Accomplishments:

Public Affairs

- Hold at least two media roundtables to highlight FAA safety initiatives with three or more national print or television outlets.
- Conduct proactive media outreach that will result in at least seven articles, news stories or editorials in national publications or television coverage that positively highlight the FAA's work on runway safety.
- Respond to media calls within 24 hours.
- Hold at least two national media roundtables on capacity and efficiency issues with three or more national or print media outlets.
- Conduct proactive media outreach that will result in at least seven articles, news stories or editorials in national publications or television coverage that positively highlight aviation safety improvements.
- Hold at least two media roundtables to educate reporters about international leadership initiatives.

Internal Communications

- FOCUS FAA: Increase readership, frequency of postings while reducing costs overall.
- Via FOCUS FAA, initiate Administrator's audio log, and News of the Week in Review audio programming.
- Provide quarterly updates to Financial Services.
- Update AOC's infrastructure and application inventory.
- Provide guidance and assistance for distributing employee safety information in a variety of formats, including web-cast interviews, employee web site enhancements, broadcast messages, Focus FAA.
- Analyze data from reports to ensure quarterly reviews of inactive AOC obligations were performed

within 90 days of the end of the quarter.

- Publish real time agency news on a daily basis during the Fiscal Year.
- Read and evaluate all employees' feedback and respond within 24 hours.
- Conduct more than 12 webcast interviews during the Fiscal Year.

Website

- Publish individual LOB and Staff Office web publishing guidelines, procedures, and web points of contact on the employee website and provide a link from the web standards website.
- Sponsor six on-location or web-based training sessions to help employees improve web content and usability. At least three sessions must be available to FAA regional employees.
- Continue usability testing of top visited public and employee web pages and web-based applications to improve ease of use, quality of information, and task completion. Complete three major usability projects including, HR content onemployees.faa.gov, FAA Jobs website and application and Aviation Safety Information System – combining RGL & FSIMS.
- Implement Omniture web analytics platform to report on FAA.gov, employee website, and select FOB web properties. Combine data from web analytics program with survey data to provide holistic, strategic recommendations to improve customer and employee satisfaction.
- Achieve an average ACSI satisfaction score of 72 or better on the FAA public website for FY 2009.
- Answer 98 percent of questions through self-service in the FAQ knowledge base on the public website and 100 percent of questions sent to FAA experts within 30 days.
- Launch Web Improvement Program -- continuous website enhancements to optimize user experience on FAA.gov and Employees.FAA.gov. including new orders and notices application and pilots portal page.

FY 2010 Budget Request:

For FY 2010, the Office of Communications requests $6,892,000 and 34 FTEs to meet its mission. This increase will provide for pay raises and inflation. The following activities represent the FY 2010 budget request:

Public Affairs

- Hold at least six media roundtables to highlight FAA accomplishments
- Evaluate the use of social media to support media outreach activities
- Conduct proactive outreach that results in media stories that positively highlight FAA initiatives
- Increase media training for FAA executives

Internal Communications

- Continue to increase frequency of news postings on FOCUSFAA to employees.
- Develop additional video and other programming.
- Evaluate use of short-format video programming and MP3 programming formats to deliver news to employees.
- Increase readership by 2 percent annually.
- Strengthen FAA branding program.
- Evaluate use of social media for employee news dissemination such as blogs and Twitter etc.

Web Management

- Achieve an average ACSI satisfaction score of 72 or better on the FAA public website for FY 2010.
- Answer 98 percent of questions through self-service in the FAQ knowledge base on the public website and 100 percent of questions sent to FAA experts within 15 days.
- Launch improved Advisory Circulars application
- Continue FAA Web Management Training Program

- Launch improved streaming video service for FAA internal and external customers
- Implement strategy to ensure code security on FAA.gov, Employees.FAA.gov and Intranet.FAA.gov
- Kickoff Registry and Regulatory Guidance Library Usability projects
- Continue supporting 42 web applications for LOBs and Staff Offices.

OPERATIONS APPROPRIATION

Chief Counsel (AGC)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2009 Enacted (Omnibus)	**43,575**	**242**	**9**	**246**
FY 2009 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0	10		10
2. Annualized FY 2009 Pay Raise (GS Population)	119			
3. Annualized FY 2009 Pay Raise (Core Comp Population)	278			
4. January 2010 Pay Raise (GS Population)	272			
5. January 2010 OSI (Core Comp Population)	552			
6. January 2010 SCI	116			
7. Non-pay inflation	33			
8. GSA Rent Increase	0			
Total Unavoidable Adjustments	**1,369**	**10**	**0**	**10**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. DOL Wage Determination Increases	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. Air Traffic Controller Hiring	0			
2. NextGen Staffing Increase	0			
3. UAS / Drug Inspector Staffing	0			
4. AVS Analytical Program Staff	0			
5. ASIAS Contract Support	0			
6. NextGen Environmental/Noise	0			
7. Congestion Studies	0			
8. National Security Systems Classified/ Controlled Information	0			
9. National Security Coordination Division/ Counter Intelligence	0			
10. Equal Employment Opportunity (EEO) and Civil Rights Programs	0			
11. FAA Privacy Program	0			
12. Automated Staffing and Processing (ASAP)	0			
13. Financial Systems Upgrades	0			
Total Discretionary Increases	**0**	**0**	**0**	**0**
Cost Efficiencies				
1. Rents, Utilities, and Leases	0			
2. Service Center Business Process Reengineering	0			
3. Administrative Overhead Efficiencies	0			
Total Cost Efficiencies	**0**	**0**	**0**	**0**
Base Transfers				
1. Air Traffic Controller Hiring Support	0			
2. Automated Staffing and Application Process (ASAP) System Enhancements	0			
3. Labor Relations Improvements	0			
4. Technical Library	651	2		2
5. Office of Audit and Evaluation	1,422	11		11
6. Panorama Business Views (PB Views)	0			
7. Tech Ops Hiring	0			
8. Litigation Support	2,000	9		5
9. Emergency Communications	0			
10. FAA Historian	184	1		1
11. Clinical Psychologist	0			
12. Acquisition Support (AMQ) to Franchise Fund	0			
Total Base Transfers	**4,257**	**23**	**0**	**19**
FY 2010 Request	**49,202**	**275**	**9**	**275**

Detailed Justification for Staff Offices – AGC

Chief Counsel (AGC)	**FY 2010 Request: $49,202**

Overview:

The Chief Counsel has primary responsibility for providing legal services and support to the FAA Administrator, all program offices, regional offices, and agency organizations worldwide. The office provides strategic counsel to FAA's senior management and represents the agency in federal court and before various administrative law forums.

FY 2009 Program:

AGC provides legal services to the FAA Administrator and all agency organizations. Principal legal practice areas include: enforcement; regulations; litigation; procurement and fiscal law; airports and environmental law; personnel and labor law; international affairs; and dispute resolution (including adjudication of bid protests through the Office of Dispute Resolution for Adjudication). AGC also provides legal practice in general law applicable to the executive branch, such as Freedom of Information Act and Ethics and Privacy Act compliance. AGC attorneys represent the agency before United States federal courts and administrative forums, including the National Transportation Safety Board (NTSB), the Merit Systems Protection Board (MSPB), and the Equal Employment Opportunity Commission (EEOC).

The office's principal legal practice areas and program responsibilities integrally tie to the goals of the FAA Flight Plan. AGC supports the agency's safety goals through its role in enforcement of federal aviation regulations and support of voluntary compliance programs; drafting, review and interpretation of regulations; and litigation activity (including defense of ATC tort claims). In the capacity arena, AGC plays a significant role in both applying agency policy designed to relieve congestion at key airports and supporting the related competition goals of the DOT. AGC also plays a critical role in advising Airports and ATO about the legal and environmental implications of runway expansions, terminal improvements, and redesign of the national airspace. Further, AGC provides procurement legal services essential to getting the safety and capacity enhancing equipment and technology needed to support the national airspace system and the agency's Flight Plan. In the international goal area, AGC develops the agency position on international law issues and serves as a liaison for FAA international aviation legal matters with other government agencies and industry. Finally, in support of the agency's overall goal of achieving organizational excellence, AGC provides advice and guidance to key agency officials on personnel, labor law, and civil rights matters and the various general law disciplines applicable to all federal agencies.

Anticipated FY 2009 Accomplishments:

- Support Flight Plan initiative relating to third-party development of RNP Procedures
- Prioritize and prosecute enforcement actions in accordance with FAA's safety goals.
- As part of the Compliance Review Team, implement program evaluation plan to assess targeted enforcement initiative and use of enforcement decision tool.
- Provide training to enforcement investigative personnel.
- Support FAA rulemaking activities and improvements by ensuring rules meet legal standards and conduct monthly outreach to primary client offices.
- With the Office of Rulemaking (ARM), complete 80 percent of critical safety rules within 90 days of first OST due date.
- Complete 50 percent of new requests for interpretations within 120 days of receipt.
- Ensure timely representational legal services and, as necessary, keep administrator apprised of quarterly contingent liability matters.

- Support Flight Plan initiative related to maintaining average daily capacity at seven metropolitan airports.
- Support Flight Plan initiative to maintain scheduled progress for Environmental Impact Statements at West Palm Beach, South Suburban (Chicago), Ft. Lauderdale, and Philadelphia Airports.
- Support Flight Plan initiative to increase annual service volume of the 35 OEP airports by at least one percent annually.
- Support Flight Plan initiative to ensure established milestones and completion dates for Southern Nevada Supplemental Airport, Houston George Bush Intercontinental, and Portland International EIS studies are met in FY 2008.
- Generally, docket or dismiss Part 16 complaints within 20 calendar days.
- Refine criteria used to measure effectiveness and timeliness of environmental projects and to evaluate environmental streamlining initiatives.
- Review all procurement documents sent for legal review within 10 days and conduct monthly outreach meetings with primary procurement client offices.
- With ATO and ABA, improve management and oversight of support service contract practices by implementing, monitoring and evaluating policy changes and actions.
- Provide legal services supporting drafting and negotiation of international agreements; prepare the U.S. position on matters before International Civil Aviation Organization (ICAO); support the Aviation Insurance Program; assist API initiative relating to regional safety oversight system in the Caribbean; and support the DOT mission relating to technical assistance in Iraq.

FY 2010 Budget Request:

For FY2010, the Chief Counsel requests $49,202,000 and 275 FTE to meet its mission. The request provides for basic pay raises and inflation for AGC programs as well as 10 FTP above the FY 2009 enacted level that will be funded within existing resources. The request includes $4.3 million and 23 positions base transferred from other FAA organizations, including $1.4 million to establish the new FAA office of Audit and Evaluation.

AGC provides legal services to the FAA Administrator and all lines of business with critical program responsibilities. Principal legal practice areas include: regulatory enforcement; rulemaking; litigation; acquisition, commercial and fiscal law; airports and environmental law; personnel and labor law; international affairs; and alternative dispute resolution/conflict management services (including adjudication of bid protests through the Office of Dispute Resolution for Adjudication). AGC also supports programs with general applicability to executive branch agencies, including the Freedom of Information Act, Government Ethics and Privacy Act compliance. Significantly, AGC attorneys represent the agency before United States federal courts and various administrative forums, including the National Transportation Safety Board (NTSB), the Merit Systems Protection Board (MSPB), and the Equal Employment Opportunity Commission (EEOC).

The office's principal legal practice areas and program responsibilities are integrally linked to the FAA's mission and the goals of the Flight Plan. AGC directly supports the agency's safety mission by: prosecuting violations of the federal aviation regulations, as well as, providing legal support of voluntary compliance programs; ensuring that critical safety rules are both legally sufficient and completed timely; providing timely and accurate agency responses to public requests for interpretations of the regulations; assisting in FAA accident investigation activities; and vigorously representing the agency and agency personnel in air crash and other tort litigation. In the capacity arena, AGC plays a significant role in FAA's congestion management activities. AGC provides critical legal advice and representation to major program offices regarding the legal and environmental implications of runway expansions, terminal improvements, and redesign of the national airspace. Further, AGC provides acquisition and commercial legal services that are essential to development, acquisition and deployment of the safety and capacity enhancing equipment and technology needed to support the national airspace system and the agency's Flight Plan. In the international goal area, AGC develops the agency position on international law issues and provides legal support on FAA international aviation matters. Finally, in support of the agency's overall goal of achieving organizational excellence, AGC provides advice and guidance to key agency officials on personnel, labor law, and civil rights matters and the various general law disciplines applicable to all federal agencies.

In addition to the activities generally described above, the following largely represents the FY 2010 budget request:

- Support Flight Plan initiative to reduce the commercial air carrier fatality rate by sending critical safety rules to the Office of the Secretary of Transportation within 90 days of the planned date.
- Support Flight Plan target to Achieve specified average daily airport capacity for the 7 Metro areas by:
    - Managing and implementing national policy on aviation congestion;
    - Monitoring and maintaining scheduled progress for Environmental Impact Statements at Philadelphia and Southern Nevada (located within the seven Metro areas);
    - Supporting redesign of the airspace of the seven Metro areas by monitoring and maintaining schedules progress for environmental review to redesign the airspace and air traffic systems for Boston, San Francisco, Atlanta, Washington/Baltimore, and Western Corridor and providing legal advice to support ongoing implementation and representational legal services to defend the NY/NJ/PHL Metropolitan Airspace Redesign.
- Support the Flight Plan Target of increasing annual service volume at the 35 OEP airports by at least 1 percent annually by monitoring and maintaining scheduled progress for the Houston George Bush Intercontinental and West Palm Beach Airport EIS studies.
- Support the Flight Plan Target of achieving a NAS on-time arrival rate of 88% at the 35 OEP airports by providing legal review and guidance as needed to congestion action teams working to mitigate forecasted delay.
- Provide legal support for efficient administration of the Airport Improvement Program, passenger facility charge program, and airport compliance program, including legal review of policy and regulatory guidance and Part 16 determinations.
- Timely process complaints of grant noncompliance and improper diversion of airport revenue.
- Conduct recurrent training for legal staff and client offices on environmental and airport aviation issues.
- Support rulemaking activities and improvements by ensuring rules meet legal standards.
- Complete 50 percent of public request for regulatory interpretations within 120 days of receipt.
- Prioritize and efficiently prosecute enforcement actions by taking the first legal action on 80 percent of cases received during a 12 month period.
- Conduct 50 percent of informal conferences in legal enforcement actions within 90 days of receipt of a respondent's request, and 75 percent within 180 days.
- Monitor and reduce backlog of enforcement actions by maintaining a ratio of cases closed to cases received to greater than 60 percent office wide.
- Streamline the coordination and approval of significant enforcement actions with headquarters by submitting 70% of safety alerts to the program office for concurrence within 45 days of receipt in AGC headquarters.
- Provide training for new enforcement attorneys and refresher training to enforcement investigative personnel.
- Support FAA air crash investigation teams and represent the agency and agency personnel in all phases of air crash litigation and other tort litigation.
- Complete all tort claim analysis within six months of receipt of claim and complete agency contingent liability report by quarterly due date.
- Promote efficiency in acquisition process by completing legal review of all procurement documents within 10 days.
- Proactively provide training to contracting personnel (contract officers, specialists, and contracting officer technical representatives) on agency procurement policies and procurement integrity.
- Proactively establish formal oversight program to review contract formation and administration policies and procedures and provide support to the National Acquisition Evaluation Program.
- Provide adjudicative and alternative dispute resolution services for bid protests and contract disputes.
- Provide legal services relating to drafting and negotiation of international agreements and provide legal support for the Aviation Insurance Program.
- Provide legal assistance to FAA Program Offices on technical issues involving ICAO Standards and Recommended Practices and assist in preparing the U.S. positions for the 2010 ICAO Assembly.

- Support Safe Skies for Africa Program effort to promote development of a Regional Safety Oversight Organization (RSOO) by presenting model draft laws that satisfy ICAO standards to the East African Community States of Kenya, Tanzania, and Uganda by December 31, 2009; and present an international enforcement and compliance workshop in one or more Banjul Accord States.
- Meet five Flight Plan Organizational Excellence Targets involving 10 strategic activities as required.
- Provide timely representation in employment law matters by meeting all employment case deadlines before the EEOC, MSPB and federal courts.
- Provide timely advice to clients on employment law matters by responding to 80% of requests for opinions, advice, and training within 10 working days.
- AGC will house the newly established Audit and Evaluation Office (AAE), whose function is to provide a centralized focus for safety-related complaints and other critical audits and investigations. AAE will serve as a centralized entry point for disclosures and recommendations on safety-related issues, whistleblower matters, and the various FAA hotlines. The offices will also serve as a point of contact and oversight for matters related to the DOT Office of the Inspector General (OIG), the Government Accountability Office (GAO), and the Office of Special Counsel (OSC).

OPERATIONS APPROPRIATION

Aviation Policy, Planning & Environment (AEP)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2009 Enacted (Omnibus)	**13,797**	**82**	**1**	**83**
FY 2009 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0	5		5
2. Annualized FY 2009 Pay Raise (GS Population)	79			
3. Annualized FY 2009 Pay Raise (Core Comp Population)	39			
4. January 2010 Pay Raise (GS Population)	181			
5. January 2010 OSI (Core Comp Population)	77			
6. January 2010 SCI	16			
7. Non-pay inflation	10			
8. GSA Rent Increase	0			
Total Unavoidable Adjustments	**402**	**5**	**0**	**5**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. DOL Wage Determination Increases	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. Air Traffic Controller Hiring	0			
2. NextGen Staffing Increase	0			
3. UAS / Drug Inspector Staffing	0			
4. AVS Analytical Program Staff	0			
5. ASIAS Contract Support	0			
6. NextGen Environmental/Noise	1,665	5		5
7. Congestion Studies	216	3		3
8. National Security Systems Classified/ Controlled Information	0			
9. National Security Coordination Division/ Counter Intelligence	0			
10. Equal Employment Opportunity (EEO) and Civil Rights Programs	0			
11. FAA Privacy Program	0			
12. Automated Staffing and Processing (ASAP)	0			
13. Financial Systems Upgrades	0			
Total Discretionary Increases	**1,881**	**8**	**0**	**8**
Cost Efficiencies				
1. Rents, Utilities, and Leases	0			
2. Service Center Business Process Reengineering	0			
3. Administrative Overhead Efficiencies	0			
Total Cost Efficiencies	**0**	**0**	**0**	**0**
Base Transfers				
1. Air Traffic Controller Hiring Support	0			
2. Automated Staffing and Application Process (ASAP) System Enhancements	0			
3. Labor Relations Improvements	0			
4. Technical Library	0			
5. Office of Audit and Evaluation	0			
6. Panorama Business Views (PB Views)	1,197			
7. Tech Ops Hiring	0			
8. Litigation Support	0			
9. Emergency Communications	0			
10. FAA Historian	0			
11. Clinical Psychologist	0			
12. Acquisition Support (AMQ) to Franchise Fund	0			
Total Base Transfers	**1,197**	**0**	**0**	**0**
FY 2010 Request	**17,277**	**95**	**1**	**96**

Detailed Justification for Staff Offices – AEP

Aviation Policy, Planning, & Environment (AEP)	FY 2010 Request: $17,277

Overview:

The Office of Aviation Policy, Planning and Environment (AEP) provides critical support to the Administrator and FAA organizations in planning and policy development, and environment and energy programs.

FY 2009 Program:

In FY 2009, AEP will continue supporting agency initiatives in all of the goal areas, while concentrating our major efforts in Capacity and Organizational Excellence. Environmental efforts will focus heavily on work to provide for a quieter, cleaner, more energy efficient aviation future under NextGen. Under the Safety and Capacity goal areas, AEP plans to assure that FAA policy and economic analysis programs support safety and capacity-enhancing initiatives of the agency, and that the agency benefits from superior decision support tools and innovative mitigation approaches that it needs to ensure responsive strategies that allow aviation to grow in an environmentally responsible manner. Our activities under the goal of Organizational Excellence will revolve around supporting agency initiatives to help employees see the link between their jobs and agency goals.

Anticipated FY 2009 Accomplishments:

- By September 30, 2009, at least 80 percent of the rules approved by the Rulemaking Management Council should be out of the agency no later than 90 days after the scheduled date. For a significant rule, out of the agency is when the rule is sent to the Office of the Secretary of Transportation (OST). For a non-significant rule, out of the agency is when the rule is issued.
- Complete the Joint Planning and Development Office (JPDO) Environmental Working Group FY 2009 work goals and plan for NextGen.
- Continue phased development of Environmental Management System (EMS) to manage environmental impacts of NextGen.
- Support assessments and measure performance of drop-in (e.g., coal-derived liquids) alternative fuels for commercial aircraft, and establish potential of using renewable alternative fuels.
- Design a framework to analyze NextGen environmental targets.
- Initiate development of policy for effective integrated use of interdependent models for aviation noise/emissions.
- Identify promising opportunities for airport surface management operations (SMO) that optimize aircraft sequencing and timing to reduce emissions and fuel burn, and develop a new queuing network model of the departure processes at airports that can be used to develop advanced queue management strategies to decrease fuel burn and emissions.
- Support development of noise, air quality and fuel burn reduction technologies to pursue under the Continuous Low Energy Emissions and Noise (CLEEN) program.
- Complete annual assessment of number of people exposed nationally to significant aircraft noise.
- Complete annual assessment of fuel burn.
- Support completion of beta version of Aviation Environmental Design Tool (AEDT) for airport.
- Work with stakeholders on defining environmental needs for Airport Cooperative Research Program.
- Support development of research roadmaps for at least two out of six critical research areas in characterizing and mitigating noise impacts.
- For the remaining critical research areas in characterizing and mitigating noise impacts,

support development of research roadmaps by planning and conducting workshops.

- Continue the work program to support the eighth meeting of the International Civil Aviation Organization Committee on Aviation Environmental Protection (ICAO/CAEP) and plan for CAEP/9 work program.
- Support continuing efforts to develop web-based media for interacting with the public on aircraft noise issues, and assess its effectiveness.
- Support effort to establish metrics that characterize human health and welfare impacts of aviation to better inform policy decisions and environmental assessments and achieve NextGen.
- Support efforts to advance noise propagation models to better capture effects of air turbulence, meteorology, terrain, and the characteristics of low-frequency noise.
- Refine EMS to conform to Executive Order 13423.
- Roll-up the Lines of Business cost and performance baseline developed in FY 2008 to set EMS targets for future years.
- Conduct two EMS External Audits and compile the Administrator's EMS management review.
- Support campaign to collect Particulate Matter (PM) and Hazardous Air Pollutants (HAPs) profiles and measurements to isolate sources.
- Continue assessing the relative effect of various emissions on climate forcing functions to apply to ICAO/CAEP analyses.
- Support assessing whether there are unique health effects, particularly for NextGen scenarios, associated with PM emissions and HAPs from aviation sources, with specific focus on the aircraft engine.
- Support assessing uncertainty of impact of aviation on climate change with special emphasis on the effects of contrails
- Support assessment of aviation impacts on regional air quality
- Support development of guidance on dispersion modeling (i.e., assessment of aviation-related emission concentrations that affect air quality).
- Hold a forum on current environmental trends and modernization issues for FAA National Environmental Policy Act (NEPA) specialists.
- Publish the annual FAA Aerospace Activity Forecast.
- Publish Long Range Aerospace Forecast.
- Publish the Terminal Area Forecasts.
- Publish the Air Route Traffic Control Center (ARTCC) forecasts.
- Publish US Airmen Statistics.
- Publish 95 percent of daily and monthly reports from Air Traffic Operations Network (OPSNET), Air Traffic Activity Data System (ATADS), Enhanced Traffic Management System Counts (ETMSC), and Terminal Area Forecast (TAF) on time.
- Plan and conduct the 34th Annual Aviation Forecast Conference.
- Publish and distribute quarterly report highlighting aviation industry traffic and revenue trends to internal AEP and/or FAA customers.
- Respond to agency customer requests for information and insights with regard to analyses, statistics, and recommendations on aviation industry issues.
- Issue premium and non-premium insurance policies no later than the effective date of the policies.
- E-business electronic access to insured air carriers and DoD will be available 90 percent of the time.
- Insurance policy reconciliations will be initiated within the time conditions set forth in each air carrier's policy of insurance and a refund or additional collection implemented no later than 120 days after receipt of reconciliation data from each air carrier or the availability of allotted budget,

whichever is later.

- Complete a Grand Canyon overflights plan, and manage aviation issues at other national parks.
- Complete Benefit Cost Analysis (BCA) for contract towers and approaches as requested by ATO.
- Complete 85 percent of ARP BCA within the timeframe agreed upon in the service level agreement (SLA).
- Conduct policy option analyses to support CAEP/8.
- Complete significant demonstration of clean and quiet operations with an international partner.
- Provide inputs on assigned Interagency Group on International Aviation (IGIA) items.
- To the extent possible, ensure economic policies and guidance adopted by ICAO reflect U.S. reviews.

FY 2010 Budget Request:

For FY 2010, the Office of Aviation Policy, Planning and Environment requests $17,277,000 and 96 FTEs to meet its mission. This increase will provide for pay raises and inflation, and also includes discretionary increases of $1.9 million. Of this amount, $216,000 is for 3 FTEs related to Congestion studies and $1,665,000 for NextGen Environmental and Noise studies. The NextGen Environmental/Noise studies will ensure the modernization of the national airspace system through NextGen is done in an environmentally responsible way and that maximum environmental benefits will be attained. The NextGen studies will ensure that the impact of market-based measures as well as congestion and delay issues are dealt with effectively as new technologies and operational paradigms are developed under the NextGen plan.

In FY 2010 AEP will continue supporting agency initiatives in all of the goal areas, while concentrating our major efforts in Capacity, International Leadership, and Organizational Excellence. Environmental efforts will focus heavily on work to provide for a quieter, cleaner, more energy efficient aviation future under NextGen. Under the Safety and Capacity goal areas, AEP plans to assure that FAA policy and economic analysis programs support safety and capacity-enhancing initiatives of the agency, and that the agency benefits from superior decision support tools and innovative mitigation approaches that it needs to ensure responsive strategies that allow aviation to grow in an environmentally responsible manner. In support of International Leadership, AEP represents the United States on various panels, committees and working groups of the International Civil Aviation Organization and in other international forums. Goal is harmonized environmental and economic standards, practices and guidance materials consistent with U.S. interests. Our activities under the goal of Organizational Excellence will revolve around supporting agency initiatives to help employees see the link between their jobs and agency goals.

- Perform economic analyses of agency rulemaking and regulatory projects to promote safety in the aviation and commercial space industries. By September 30, 2010, at least 85 percent of the rules approved by the Rulemaking Management Council should be out of the agency no later than 90 days after the scheduled date. For a significant rule, out of the agency is when the rule is sent to OST. For a non-significant rule, out of the agency is when the rule is issued.
- Complete JPDO Environmental Working Group FY 2010 work goals and plan for NextGen.
- Continue phased development of EMS to manage environmental impacts of NextGen.
- Support assessment of aviation alternative fuels and CLEEN technologies and NAS infrastructure relationships and integration benefits.
- Support planning for comprehensive "drop-in" aviation alternative fuel demonstration.
- Refine framework for analyzing NextGen environmental targets.
- Continue development of policy for effective integrated use of interdependent models for aviation noise/emissions.
- Support efforts to design and test airport surface management operations (SMO) that optimize aircraft sequencing and timing to reduce emissions and fuel burn.
- Support efforts to conduct component and integrated system level analyses for technologies

identified under the Continuous Lower Energy Emissions and Noise (CLEEN) program.

- Initiate development of policy recommendations regarding congestion management initiatives at capacity constrained airports.
- Coordinate efforts to reassess which metropolitan areas will have the most impact on the total aviation system delays. Goals are to determine any necessary changes to the target areas and airports based on changes in growth or capacity, and to mitigate delays.
- Lead the implementation of FAA reauthorization as required by statute. Develop, provide analysis and technical assistance on draft legislative proposals and implement legislation on current and new programs as necessary for the reauthorization.
- Develop and analyze forecasts of Aviation Trust fund revenues and expenditures at least twice a year. Develop and analyze proposals for alternatives to current tax structures.
- Update Air Traffic Organization cost allocation as activity and cost accounting data becomes available.
- Complete annual assessment of number of people exposed nationally to significant aircraft noise.
- Complete annual assessment of fuel burn.
- Support efforts to further advance Aviation Environmental Design Tool (AEDT) and initiate model assessment by Deign Review group in preparation of Tools public release.
- Support efforts to further advance Environmental Design Space tool to include additional vehicles for environmental tradeoff analyses.
- Work with stakeholders to identify additional environmental needs for Airport Cooperative Research Program.
- Support effort to establish metrics that characterize human health and welfare impacts of aviation to better inform policy decisions and environmental assessments.
- Support effort to advance noise propagation models to better capture effects of air turbulence, meteorology, terrain, and the characteristics of low-frequency noise.
- Support efforts to explore environmental control algorithms that will enable Continuous Descent Arrival (CDA) implementation at higher traffic levels and still reduce fuel burn, emissions, and noise.
- Support efforts to develop a fuel-optimal, multi-flight-level conflict resolution algorithm and initiate a simulation study for demonstrating en route traffic operations that reduce fuel burn and emissions.
- Use Lines of Business cost and performance baseline to set EMS targets for future years.
- Conduct one EMS External Audits and compile the Administrator's EMS management review.
- Support efforts to complete data analysis and reporting related to the continued collection of PM and HAPs profiles and measurements to isolate sources.
- Support efforts to complete assessment of the relative effect of various emissions on climate forcing functions to apply to ICAO/CAEP analyses.
- Support efforts to complete assessment of any unique health effects, particularly for NextGen scenarios, associated with PM emissions and HAPs from aviation sources, with specific focus on the aircraft engine.
- Support efforts to continue assessment of uncertainty of impact of aviation on climate change with special emphasis on the effects of contrails.
- Support efforts to continue assessment of aviation impacts on regional air quality.
- Support efforts to complete development of guidance on dispersion modeling (i.e., assessment of aviation-related emission concentrations that affect air quality).
- Support efforts to complete development and implementation of guidance materials for assessing HAP emissions associated with airport sources, particularly aircraft.
- Support efforts to complete development and implementation of guidance materials for assessing greenhouse gas emissions associated with airports.

- Develop and publish an annual FAA Aerospace Activity Forecast out to FY 2030 which forms the basis for NextGen.
- Develop and publish the Terminal Area Forecasts to support agency business planning for, among other things, controller workforce planning.
- Develop and publish additional aerospace forecasts, including a long-range Aerospace Forecast and ARTCC forecast to support agency and NextGen planning needs.
- Develop forecasts to support International Civil Aviation Organization (ICAO) traffic forecast needs.
- Plan and conduct the 35th Annual Aviation Forecast Conference.
- Develop and publish a wide variety of statistics on the National Airspace system, its components, and its performance providing a basis for NextGen.
- Develop and publish quarterly report highlighting aviation industry traffic and revenue trends. Perform analyses, collect statistics, and provide recommendations on aviation industry issues as requested.
- Publish 95 percent of daily and monthly reports from OPSNET, ATADS, ETMSC, and TAF on time.
- Publish and distribute quarterly report highlighting aviation industry traffic and revenue trends to internal AEP and/or FAA customers.
- Respond to agency customer requests for information and insights with regard to analyses, statistics, and recommendations on aviation industry issues.
- Issue premium and non-premium insurance policies no later than the effective date of the policies.
- E-business electronic access to insured air carriers and DoD will be available 90 percent of the time.
- Insurance policy reconciliations will be initiated within the time conditions set forth in each air carrier's policy of insurance and a refund or additional collection implemented no later than 120 days after receipt of reconciliation data from each air carrier or the availability of allotted budget, whichever is later.
- Support Grand Canyon overflights plan, and manage aviation issues at other national parks.
- Complete BCA for contract towers and approaches as requested by ATO.
- Complete 85 percent of ARP BCA within the timeframe agreed upon in SLA.
- Conduct policy option analyses for CAEP/8.
- Support efforts to continue significant demonstration of clean and quiet operations with an international partner.
- Provide inputs on assigned Interagency Group on International Aviation (IGIA) items.
- To the extent possible, ensure economic policies and guidance adopted by ICAO reflect U.S. reviews.
- Support efforts to advance elements in the noise research roadmaps for the critical research areas in characterizing and mitigating noise impacts.
- Complete CAEP/8 work program and initiate work on CAEP/9 work program.
- Support efforts to continue to assess effectiveness of web-based media for interacting with the public on aircraft noise issues.

OPERATIONS APPROPRIATION

International Aviation (API)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2009 Enacted (Omnibus)	**17,908**	**62**	**1**	**65**
FY 2009 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0			
2. Annualized FY 2009 Pay Raise (GS Population)	56			
3. Annualized FY 2009 Pay Raise (Core Comp Population)	58			
4. January 2010 Pay Raise (GS Population)	128			
5. January 2010 OSI (Core Comp Population)	116			
6. January 2010 SCI	24			
7. Non-pay inflation	34			
8. GSA Rent Increase	0			
Total Unavoidable Adjustments	**418**	**0**	**0**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. DOL Wage Determination Increases	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. Air Traffic Controller Hiring	0			
2. NextGen Staffing Increase	0			
3. UAS / Drug Inspector Staffing	0			
4. AVS Analytical Program Staff	0			
5. ASIAS Contract Support	0			
6. NextGen Environmental/Noise	0			
7. Congestion Studies	0			
8. National Security Systems Classified/ Controlled Information	0			
9. National Security Coordination Division/ Counter Intelligence	0			
10. Equal Employment Opportunity (EEO) and Civil Rights Programs	0			
11. FAA Privacy Program	0			
12. Automated Staffing and Processing (ASAP)	0			
13. Financial Systems Upgrades	0			
Total Discretionary Increases	**0**	**0**	**0**	**0**
Cost Efficiencies				
1. Rents, Utilities, and Leases	0			
2. Service Center Business Process Reengineering	0			
3. Administrative Overhead Efficiencies	0			
Total Cost Efficiencies	**0**	**0**	**0**	**0**
Base Transfers				
1. Air Traffic Controller Hiring Support	0			
2. Automated Staffing and Application Process (ASAP) System Enhancements	0			
3. Labor Relations Improvements	0			
4. Technical Library	0			
5. Office of Audit and Evaluation	0			
6. Panorama Business Views (PB Views)	-2			
7. Tech Ops Hiring	0			
8. Litigation Support	0			
9. Emergency Communications	0			
10. FAA Historian	0			
11. Clinical Psychologist	0			
12. Acquisition Support (AMQ) to Franchise Fund	0			
Total Base Transfers	**-2**	**0**	**0**	**0**
FY 2010 Request	**18,323**	**62**	**1**	**65**

Detailed Justification for Staff Offices – API

International Aviation (API)	**FY 2010 Request: $18,323**

Overview:

The Assistant Administrator for International Aviation (API) is responsible for coordinating U.S. leadership in the international aviation community and advancing safety internationally by broadening our strategic relationships, providing targeted technical assistance, and promoting harmonized safety solutions in an environmentally friendly manner.

The United States has long been a leader in the international aviation community. The FAA operates the largest and most complex aviation system in the world, controlling almost half of the world's air traffic. The FAA certifies more than two-thirds of the world's large jet aircraft and provides direct or indirect aviation assistance to more than 130 countries. While international air travel to the United States has increased by 15 percent over the last five years, the number of fatalities has decreased 18 percent in the same period. U.S. industry is continuously developing and implementing new technologies to create a safer, more efficient, global airspace system. The United States is also the largest contributor of technical and financial support to the International Civil Aviation Organization (ICAO), which represents 190 of the world's civil aviation authorities.

FY 2009 Program:

API has identified three performance targets to ensure that FAA remains the world leader in aviation. These performance targets are:

CAST Safety Enhancements: Work with the Chinese aviation authorities and industry to adopt 27 proven Commercial Aviation Safety Team (CAST) safety enhancements by FY 2011. This supports China's efforts to reduce commercial fatal accidents to a rate of 0.030 fatal accidents per 100,000 departures by FY 2012 The goal of working with China's Aviation Authority to adopt 27 CAST Enhancements by FY 2011 began in FY 2007 and breaks out as follows:

FY 2007, the goal was seven, API achieved 10.
FY 2008, the goal was five, API achieved five.

Given the current pace of CAST adoptions by CAAC at 15 of 27 beginning in FY 2009, API believes that in the three years that remain (2009, 2010, and 2011), FAA should be able to meet the goal of adoption of an additional eight enhancements. FY 2010 Target: four CAST Safety Enhancements

International Aviation Development Projects: By FY 2013, arrange commitments for external funding for at least 35 aviation development projects (seven per year). Beginning in FY 2009, the goal to secure 35 aviation development projects by FY 2013 was a refinement of goals for securing external funding for aviation projects. The refinement changes API focus from dollar amounts and reflects the desire to increase the number of aviation projects in order to provide this type of assistance to more countries. In FY 2008, still under the dollar amount metric, API secured a total of 12 new projects, four of which were in the same country. Beginning in FY 2009, API is only counting by project with a maximum of one per country, which will make the goal more difficult to reach. Based on past performance conducting this type of work (though by a different measure), API believes this is a stretch, but reachable goal. The seven year goal of a total of 35 programs reflects what will be an increasing level of difficulty in reaching out to new areas for development projects. FY 2010 Target: seven projects

NextGen Technology: By FY 2013, expand the use of NextGen performance-based systems and concepts to five priority countries. The goal of expanding the use of NextGen performance-based systems and concepts to five priority countries by FY 2013 was initiated in FY 2005 and breaks out as follows:

FY 2005, one - the goal and the actual achieved
FY 2006, one - the goal and the actual achieved
FY 2007, one - the goal and the actual achieved
FY 2008, one - the goal; actual achieved: two

With five so far, the overall goal is complete, however, the goal remains a priority. Work on an additional country for FY 2009 is underway at this time. FY 2010 Target: one country.

To achieve these performance targets, API will coordinate FAA international activities among the lines of business, with our bilateral partners, regional multinational aviation safety organizations, and ICAO. The ultimate objective is to make air travel as safe and efficient abroad as it is at home.

Anticipated FY 2009 Accomplishments

- Determine location for the establishment and staffing of a second location in Latin America.
- Support the Civil Aviation Assistance Team in Kabul, Afghanistan, with funding from other U.S. government and international lending sources. At this point in time, no specific amount is confirmed.
- Correlate essential USG Standards and Recommended Practices (SARPS) change objectives to the ICAO budget.
- Continue implementation of presidential international civil aviation safety programs for Africa, Asia, the Americas, and the Middle East.
- Provide continued support for the development of a regional safety oversight organization with the East African Community.
- Work through ICAO and regional aviation organizations in the western hemisphere to enable member countries to reach greater compliance with ICAO safety standards through training and technical assistance. API is currently working with a number of countries on a variety of training and assistance programs (e.g., Pilot Licensing Exams, Inspector Training Systems, and Airworthiness Inspector Training).
- Work with FAA Lines of Business to develop international aviation projects. Examples include China Aviation Safety Symposium, Caribbean definitional mission for specific follow-on safety training, and an African Regional Safety Conference. Arrange external funding for these projects and others, and conduct outreach activities to transfer aviation development knowledge.
- Support creation of government and industry partnerships to facilitate the transfer of aeronautical products, services, and technologies to key developing regions.
- Expand the use of NextGen technologies, in particular, GPS technologies and procedures, to five more priority countries.

FY 2010 Budget Request:

For FY 2010, the Assistant Administrator for International Aviation requests $18,323,000 and 65 FTEs to meet its mission. This increase will provide for pay raises and inflation. The following activities represent the FY 2010 budget request:

- Identify and provide technical assistance and training and strengthen mutually beneficial partnerships with key civil aviation authorities throughout the world.
- Continue implementation of presidential international civil aviation safety programs for Africa, Asia, the Americas, and the Middle East.
- Expand the technical capabilities (e.g. safety oversight, airport, etc.). of the Civil Aviation Assistance Team in Kabul, Afghanistan, with funding from other U.S. government (USG) and international lending sources.
- Support creation of government and industry partnerships to facilitate the transfer of aeronautical products, services, and technologies to key developing regions.
- Establish coordinated safety agendas throughout the world to improve aviation safety.
- Prioritize agency efforts to improve ICAO Standards and Recommended Practices (SARPs) to reflect advances in U.S. technologies, practices and procedures, and work with the international community to implement SARP changes.

- Provide U.S. leadership to facilitate the modernization of ICAO operations and guidance to the global aviation community.
- Identify and provide technical assistance and training to regional organizations to strengthen the capabilities of at least four regional aviation organizations to meet international safety and efficiency standards.
- Establish an effective partnership with the European Union and the European Aviation Safety Agency (EASA) to ensure the highest level of cooperation for aviation safety and an efficient exchange of products, services, and technologies.
- Strategically influence international aviation safety, capacity, and efficiency by promoting FAA recommendations and policies at key international venues.
- Work with FAA Lines of Business to develop seven international aviation projects. Arrange external funding for these projects, and conduct outreach activities to transfer aviation development knowledge.
- Work with ATO and strategic partners throughout the world to promote the expansion of NextGen supporting systems, technologies and operational enhancements. The scope covers GPS technologies, navigational aids, and other technologies (refer to the Scope section of the 2009 International Leadership Performance Target for further details).

OPERATIONS APPROPRIATION

Security and Hazardous Materials (ASH)
($ in Thousands)

Item Title	Dollars	FTP	OTFTP	FTE
FY 2009 Enacted (Omnibus)	**82,761**	**478**	**0**	**465**
FY 2009 One-Time Items	**0**	**0**	**0**	**0**
Unavoidable Adjustments				
1. Annualized FTEs	0			
2. Annualized FY 2009 Pay Raise (GS Population)	75			
3. Annualized FY 2009 Pay Raise (Core Comp Population)	572			
4. January 2010 Pay Raise (GS Population)	171			
5. January 2010 OSI (Core Comp Population)	1,136			
6. January 2010 SCI	239			
7. Non-pay inflation	122			
8. GSA Rent Increase	0			
Total Unavoidable Adjustments	**2,314**	**0**	**0**	**0**
Uncontrollable Adjustments				
1. NAS Handoff Requirements	0			
2. DOL Wage Determination Increases	0			
Total Uncontrollable Adjustments	**0**	**0**	**0**	**0**
Discretionary Increases				
1. Air Traffic Controller Hiring	0			
2. NextGen Staffing Increase	0			
3. UAS / Drug Inspector Staffing	0			
4. AVS Analytical Program Staff	0			
5. ASIAS Contract Support	0			
6. NextGen Environmental/Noise	0			
7. Congestion Studies	0			
8. National Security Systems Classified/ Controlled Information	1,300	9		9
9. National Security Coordination Division/ Counter Intelligence	713	5		5
10. Equal Employment Opportunity (EEO) and Civil Rights Programs	0			
11. FAA Privacy Program	0			
12. Automated Staffing and Processing (ASAP)	0			
13. Financial Systems Upgrades	0			
Total Discretionary Increases	**2,013**	**14**	**0**	**14**
Cost Efficiencies				
1. Rents, Utilities, and Leases	0			
2. Service Center Business Process Reengineering	0			
3. Administrative Overhead Efficiencies	0			
Total Cost Efficiencies	**0**	**0**	**0**	**0**
Base Transfers				
1. Air Traffic Controller Hiring Support	0			
2. Automated Staffing and Application Process (ASAP) System Enhancements	0			
3. Labor Relations Improvements	0			
4. Technical Library	0			
5. Office of Audit and Evaluation	0			
6. Panorama Business Views (PB Views)	-10			
7. Tech Ops Hiring	0			
8. Litigation Support	0			
9. Emergency Communications	514	5		5
10. FAA Historian	0			
11. Clinical Psychologist	0			
12. Acquisition Support (AMQ) to Franchise Fund	0			
Total Base Transfers	**504**	**5**	**0**	**5**
FY 2010 Request	**87,591**	**497**	**0**	**484**

Detailed Justification for Staff Offices – ASH

Security and Hazardous Materials (ASH)	**FY 2010 Request: $87,591**

Overview:

The Office of Security and Hazardous Materials (ASH) has the primary responsibility for protecting employees, contractors, facilities, and assets; emergency operations; contingency planning; and the safe transportation of hazardous materials in air commerce.

FY 2009 Program:

Protecting FAA's critical infrastructure is a national and homeland security concern that continues to receive high-level attention. ASH develops and implements policy to protect FAA employees, contractors, facilities, and assets. ASH conducts assessments and inspections at facilities to determine compliance with facility security, communications security, and classified and sensitive information orders and directives. ASH manages the ID Media Program for the agency and conducts suitability investigations of employees and contractors, as well as investigations of employees, nonemployees, contractors and airmen suspected of violating FAA orders and regulations. Also, ASH develops and implements national policy on transport of hazardous materials by air through regulatory inspections, training, and outreach to those involved in the hazardous materials industry worldwide.

ASH provides crisis management support by employing an integrated system of policy, procedures, personnel, facilities, and communications to ensure that FAA officials have timely and adequate information to plan, direct, and control all aspects of essential operations. Serving as the hub of the national network of operations centers, the Washington Operations Center Complex (WOCC) collects information, provides decision support, and coordinates activities essential to the daily conduct of FAA activities. In times of national emergencies, natural disasters and major incidents, WOCC functions as an action center for concentrated and accelerated agency efforts. Finally, ASH issues policy and guidance for Continuity of Operations (COOP) planning and implementation, serves as the command authority for secure telecommunications (secure telephone equipment, secure fax and defense message system) for all FAA offices, and supports the national security responsibilities of FAA.

Anticipated FY 2009 Accomplishments:

- Continue to enhance the safety of the transport of hazardous materials in aviation by working to resolve regulatory issues with the Pipeline and Hazardous Materials Safety Administration (PHMSA) and provide support with studies, rulemaking and other documentation.
- Conduct 900 outreach efforts to shippers of critical HAZMAT commodities.
- Conduct over 8,000 hazardous materials regulatory inspections as follows:
  - 5,114 shipper and repair station assessments, and
  - 3,119 air carrier station inspections.
- Conduct the following inspections at FAA facilities:
  - 96 facility security assessments,
  - 358 facility security inspections,
  - 64 Communication Security (COMSEC) inspections,
  - 73 classified information inspections, and
  - 23 Technical Surveillance Countermeasures (TSCM) surveys or inspections.
- Implement a web-based incident reporting system for use by FAA personnel.
- Build and test the core infrastructure data processing and storage capabilities to support the FAA Identification Management System (IDMS) as envisioned in the Federal Information Processing Standards (FIPS) 201-1. This will provide required validation of Personal Identity Verification (PIV)

cards issued to FAA employees and contractors.

- Continue PIV card issuing at FAA Headquarters and large offices in the Regions. Establish 100+ satellite PIV card issuing stations at smaller work sites in the Regions.
- Process 95 percent of all employee investigations for newly hired air traffic controllers (est.1900) and non-controllers (est. 3,500) by September 30, 2009.
- Process 90 percent of all contractor employee investigations (est. 6,500) by September 30, 2009.
- Complete 95 percent of investigations based on Department of Transportation Office of Inspector General (DOT/OIG) Hotline complaints within DOT/OIG specified timelines, excluding those investigations prolonged for reasons beyond the investigator's control
- Complete 95 percent of investigations with a potential impact on safety, accountability board investigations, and all other hotline complaints within 30 workdays excluding those investigations prolonged for reasons beyond the investigator's control.
- Initiate regulatory investigations on all airmen involved in the sale or distribution of illegal drugs and aircraft involved in illegal activity within 30 days of knowledge of that activity.
- Support law enforcement investigations involving airmen and aircraft.
- Ensure a national emergency operations plan and structure exists to support national and regional operations during any incidents of national significance.
- Ensure that COOP facilities and procedures are continually available and regularly exercised to maintain continual facility operational capability.
- Maintain the WOCC to ensure a 24/7 agency-wide integration of critical, time sensitive information support of FAA senior leadership, the NAS and National Security Emergency Preparedness.
- Ensure the availability of command and control communications support to WOCC and regional entities FAA-wide.
- Deliver international dangerous goods courses as requested on International Civil Aviation Organization (ICAO) requirements for shipping hazardous materials by air transport.
- Improve cyber security by ensuring 100 percent of operational and deployed systems in inventory have completed current certification and accreditation (C&A) and undergo a self-assessment if C&A is not needed.
- Develop a digital integrated communication system on the Emergency Operations Network (EON) providing timely and accurate information to senior policy officials.

FY 2010 Budget Request:

For FY 2010, Security and Hazardous Materials requests $87,591,000 and 484 FTEs to meet its mission. This increase will provide for pay raises and inflation for ASH base programs. The request also provides $2 million for improvement to National Security Systems and Programs. Of this amount, $1.3 million is to hire 9 FTEs and to provide necessary support to protect all types of information, regardless of media, and $0.7 million is for 5 FTEs to enhance the safety and security of the National Airspace System from personnel and technology exploitation by hostile intelligence services using information obtained from multiple sources. The requested amount also reflects a net increase of $0.5 million and 5 FTEs transferred from the Air Traffic Organization to support Emergency Communication and Continuity of Operations (COOP). The COOP provides full-cycle support for each of the functional locations it manages in order to effectively provide a location whereby the FAA can provide essential services during a national crisis:

Security and Hazardous Materials will enforce the hazardous materials regulations in the aviation sector issued by the Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) and execute a strategic plan with PHMSA to strengthen those regulations. Security and Hazardous Materials will also prioritize outreach efforts to target shippers of critical commodities to ensure the public, industry, and air carrier operators are educated on regulations about shipping hazardous materials by air. Finally, ASH will conduct inspections of:

- Shippers of hazardous materials that were identified during routine air carrier inspections.
- Air carriers that ship hazardous materials by air.

- Repair stations that ship hazardous materials by air.
- Shippers of hazardous materials by air that have been prioritized into risk-based categories using information shared with all DOT modal administrations.

ASH will also coordinate efforts with the Transportation Security Administration to address hazardous materials discovered as the indirect result of increased baggage and cargo security screening at airports.

ASH develops and implements policy and establishes requirements to protect FAA federal and contractor workforces, FAA facilities, systems, and operations. ASH will standardize and automate employee and contractor identification media issuance agency wide, strengthen procedures and processes for identity proofing, investigation, and media issuance affecting all FAA worksites and provide Public Key Infrastructure (PKI) and Card Management System (CMS) services in support of all Personal Identity Verification (PIV) cards in use throughout the agency.

ASH will ensure that employment, or continued employment of persons in FAA will promote the efficiency of the service and safeguard national security. This program ensures all employees, applicants and contractors have the appropriate background investigation as required by Executive, DOT, and FAA Orders. It also ensures that they receive fair and equitable treatment; are granted national security clearances when needed; and serves as the adjudicative authority in all agency security clearance denials and revocations.

ASH will investigate all allegations of misconduct by FAA employees and contractors. ASH will also conduct regulatory investigations on all airmen and aircraft involved in illegal drug activity or in threatening national security by using the NAS to commit criminal acts. ASH will provide support to law enforcement investigations involving airmen and aircraft.

The FAA is the largest contributor of technical and financial support to ICAO, which represents 190 of the world's civil aviation authorities. ASH will work with our international partners to disseminate our experience, expertise, and new technologies to ensure a safer and more secure global airspace while implementing presidential international civil aviation safety programs for Africa, Asia, the Americas, and the Middle East.

ASH will conduct facility security assessments and inspections at FAA staffed facilities to determine the status of the facility security management program and compliance with FAA Order 1600.69. ASH Servicing Security Specialists will provide national level security expertise to FAA facilities to ensure security measures counter developing threats at all FAA facilities. ASH will conduct TSCM surveys and inspections to determine compliance with FAA Order 1600.12.

ASH will inspect and assess all areas that store, handle, and/or process Classified National Security Information (C/NSI), Communications Security (COMSEC), Export Controlled Information (ECI) and Sensitive/Controlled Unclassified Information (CUI) to determine compliance with FAA Orders 1600.2, 1600.8, 1600.75, and other applicable FAA or Federal directives, and National Security Agency (NSA)/United States Air Force (USAF) directives. These assessments will include interviews and on-site refresher training (as needed) with FAA employees and contractors who routinely handle C/NSI or CUI as a part of their regularly assigned duties.

To ensure the protection and control of export controlled information (ECI) in the electronic environment, ASH will develop security and disclosure policy and procedures regarding FAA participation for exchanges of export controlled information, foreign visits, assignments and personnel exchanges, and security oversight for cleared personnel assigned overseas or with international organizations.

ASH will continue to develop and refine existing policies and procedures concerning the safeguarding of C/NSI, COMSEC, and CUI. In support of this effort, ASH will establish a National Security Systems (NSS) program to support the FAA owned computer systems, and the Electronic Key Management System (EKMS) to facilitate secure transmission of classified information across the NAS infrastructure. The NSS program will ensure that every FAA owned computer system that processes and/or transmits classified information is accredited through an established Certification and Accreditation (C&A) process that is in compliance with the guidance established by the

Committee for National Security Systems (CNSS).

ASH will also develop, refine, and administer a comprehensive C/NSI, COMSEC, and CUI outreach and education program that will train FAA employees and contractors whose duties involve and require the protection of C/NSI, COMSEC, and CUI.

ASH will conduct extensive preliminary inquiries into every occurrence of an alleged mishandling of C/NSI, COMSEC, and CUI. ASH will also direct and advise FAA Managers, employees, contractors, and security professionals on the corrective measures to take after a confirmed incident of mishandling occurs involving C/NSI, COMSEC, and/or CUI.

ASH will ensure that all FAA Special Compartmented Information Facilities (SCIF) and all classified information networks and communications systems meet required Director, Central Intelligence Directives (D/CID) or Intelligence Community Directives (ICD).

ASH will ensure that a national emergency operations program and structure exist to support national and regional operations during any Incidents of National Significance (natural or technological disasters, pandemic influenza outbreaks, terrorism incidents, and widespread communications outages). ASH will ensure the structure provides national level management, training, exercises and policy guidance on emergency readiness and response. ASH will also ensure the availability of command and control communications support through the WOCC and regional entities. This will be accomplished through:

- Planning, procurement, engineering, design, testing, and implementation of FAA-wide command and control communications, including classified messaging equipment.
- Ensuring that continuity of operations facilities and procedures, for example communications and logistics, are continually available and regularly exercised through readiness exercises and training, maintaining continual facility operational capability, and COOP Cadre management.
- Directing and providing guidance for the development, testing, and implementation of the agency-wide plan to sustain essential government services during a pandemic influenza outbreak.
- Ensuring that all personnel have adequate access to and training in the operation of secure communications equipment by providing national level management, training and policy guidance on the FAA-wide secure voice and facsimile program, and support various classified programs.
- Providing comprehensive response during national emergencies to include natural disasters, terrorist events, military mobilizations, and pandemic influenza.

ASH will further improve its cyber security by assuring the confidentiality, integrity, and availability of information and information systems. This will be accomplished by ensuring that all newly developed systems have completed current C&A and undergo a self-assessment if C&A is not required; recertify systems in the inventory; and remediate high vulnerabilities as identified in the Enterprise Security Portal (ESP).

Explanation of Funding Changes for Staff Offices

	Dollars ($000)	FTE
Staff Offices (Net Change from FY 2009 Enacted)	**$36,473**	**21**
Overview: For FY 2010, the Assistant Administrators for the 12 staff offices request $801,927,000 and 2,787 FTE to meet their respective missions. The FY 2010 request corresponds to an increase of $36,473,000 (4.8 percent) and an increase of 21 FTE (0.8 percent) over the FY 2009 enacted level. The FY 2010 request level reflects unavoidable pay raises and inflation; programmatic increases and 10 FAA base transfers. The FY 2010 FTE request level consists of annualization of 17 FTE hired in FY 2009; a net increase of 36 (36 FTE) for support staff, including NextGen environmental personnel and security personnel; and a net decrease of 28 (32 FTE) staff for base transfers, including 59 Acquisition support (AMQ) staff transferred to the Franchise Fund.		
Unavoidable Adjustments		
Annualized FTE: This is a technical correction. These additional FTP's were granted outside of the normal appropriation process and because of this action there was no appropriate line to capture the additional 17 FTP.	0	17
Annualized FY 2009 Pay Raise (GS Population): This pay raise has been calculated separately based on the employee population still under the General Schedule. This increase is needed to provide for the full-year cost associated with the 3.9 percent average government-wide pay raise in January 2009. The actual factor used is 4.8 (3.9 percent plus 0.9 percent average of Within-Grade increases). The FY 2009 portion of this pay raise will be absorbed within enacted amounts; this increase covers the first quarter of FY 2009.	533	
Annualized FY 2009 Pay Raise (Core Comp Population): This pay raise has been calculated separately based on the employee population under the Core Compensation pay plan. This increase is needed to provide for the full-year cost associated with the Organizational Success Increase (OSI) and the Superior Contribution Increase (SCI) awarded in FY 2009. The OSI is 100 percent of the 3.9 percent average government-wide pay raise plus 1.0 percent (4.9 percent). The Core Compensation system awards three different pay raises—20 percent of the population receive the OSI plus a 1.8 percent SCI, 45 percent receive the OSI plus a 0.6 percent SCI, and 35 percent receive just the OSI. The FY 2009 portion of this pay raise will be absorbed within enacted amounts; this increase covers the first quarter of FY 2010.	3,161	
FY 2010 Pay Raise (GS Population): This pay raise has been calculated separately based on the employee	1,220	

	Dollars ($000)	**FTE**
population under the General Schedule. This increase is required to provide for costs associated with base salary increases. The factor used is 2.9 percent, composed of the projected 2.0 percent government-wide pay raise in January 2010 plus 0.9 percent average of Within-Grade increases.		
FY 2010 Organizational Success Increase (OSI) (Core Comp Population): This pay raise has been calculated separately based on the employee population under the Core Compensation pay plan. This increase is required to provide for costs associated with base salary increases that are provided to employees meeting or exceeding job expectations. The factor used is 3.0 percent, composed of the projected 2.0 percent government-wide pay raise in January 2010 plus 1.0 percent for the full OSI increase (derived from the elimination of Within-Grade increases). A fundamental component of the FAA's pay-for-performance system, this increase assumes FAA will meet most of its FY 2009 performance goals.	6,280	
FY 2010 Superior Contribution Increase (SCI): This increase is required to provide for costs associated with base salary increases that are provided to employees in the Core Compensation system providing superior contributions to the organization. The factor used is 1.8 percent for 20 percent of the population and 0.6 percent for 45 percent of the population. The remaining 35 percent do not receive this increase.	1,319	
Non-Pay Inflation: This increase is needed to provide for inflationary cost increases consistent with OMB guidance that uses the FY 2010 GDP price index (year over year) of 0.5 percent.	2,151	
GSA Rent increase: The Office of Regions and Center Operations (ARC) is facing an increase in General Services Administration rent and Department of Homeland Security costs for occupied GSA-owned facilities. The increased costs have outpaced the inflationary factors built into the agency's budget submissions. This increase will assist the agency in meeting this unavoidable funding requirement.	6,325	
Discretionary Increases		
NextGen Environmental/Noise: This funding is requested to hire five FTE to manage and implement a strategic environmental management system (EMS) approach that will integrate environmental protection objectives into the core business and operational strategies of NextGen. This staff will conduct studies on evolving, non-traditional noise issues facing NextGen, including a reduced noise standard (below 65 decibels) and its impact on airport	1,665	5

	Dollars ($000)	FTE
development and airspace redesign; community conflicts over noise at small airports where very light jet (VLJ) service is anticipated; and supersonic aircraft noise. The staff will also assess national policy on congestion and delays, and ways to alleviate congestion. This funding is also requested to provide contractor support for NextGen implementation efforts, including the development of criteria for federal intervention to enhance FAA technical capabilities in several emerging policy areas: aviation's contribution to climate changes and related policy actions; noise and non-traditional noise issues, including community noise issues with airspace redesign, supersonic boom, and VLJs; and procedures for noise/emissions/energy benefits. These activities will help FAA integrate evolving environmental protection goals into the NAS, thereby reducing aviation's environmental footprint while meeting near-term NAS capacity and efficiency needs.		
Congestion Studies: The Congestion Studies will ensure that the impact of market-based measures as well as congestion and delay issues are dealt with effectively as new technologies and operational paradigms are developed under the NextGen plan.	216	3
National Security Systems Classified/Controlled Unclassified Information: This funding is requested to hire nine FTE and contractor support necessary to protect all types of information, including For Official Use Only (FOUO) information, Sensitive Security Information (SSI), Privacy Information, Personally Identifiable Information (PII), procurement sensitive information, and classified national security information, regardless of media. FAA's current information protection model was structured to protect and control information in paper form; however, there has been a dramatic increase in information received electronically or on electronic media. The National Security Systems and Classified/Controlled Unclassified Information Program encompasses the development, implementation, and oversight of agency standards for the protection of C/NSI, CUI (including SSI and PII), and Export Controlled Information (ECI) in aural, documentary or electronic form. It includes certification, accreditation and oversight of National Security Systems processing C/NSI; integration of the security disciplines and countermeasures involving the management of such information; and initial and recurring security education. Requirements for this program are directed in Executive Orders (E.O.) 12958, 12968, and 12829, as well as Committee on National Security Systems (CNSS) policies. The protection of controlled/sensitive unclassified information is required under E.O. 13388, Further Strengthening the Sharing of Terrorism Information to Protect Americans.	1,300	9

	Dollars ($000)	FTE
National Security Coordination Division/Counter Intelligence: This funding is to hire five FTE in the Counterintelligence Section of the National Security Coordination Division. This unit will directly enhance the safety and security of our National Airspace System through the protection from personnel and technology exploitation by hostile intelligence services using information obtained from multiple sources including FAA Information Security (INFOSEC). These assets will also be used to look for trends in preventing hostile actions. Primary activities will ensure our employees are properly prepared against the growing danger of these hostile services, and that our significant investments in technology are protected from theft, modification, or manipulation. As a result, vulnerabilities to our personnel, information, and technology will be minimized by lowering additional development costs resulting from theft or manipulations as well as response and recovery activities from those disabling actions that are taken against FAA operations.	713	5
Equal Employment Opportunity (EEO) and Civil Rights Programs: This funding is for seven FTE and contract support resources to expand program efforts by conducting additional mediations, barrier analysis, onsite internal/external evaluations, and outreach initiatives and techniques. Efforts will include early evaluations of harassment cases to meet the requirements of the Anti-Harassment policy, facilitation techniques, and the conduct of additional training for employees and managers on the process. FAA has been directed by Congress to provide staffing and recruitment plans to change the demographics of the FAA. Over the next 10 years, FAA will be hiring thousands of air traffic controllers, transportation specialists and aviation safety inspectors, and will need to partner with its customers and industry to reach out to minorities, women, and people with disabilities to apply for these positions. In addition, the DOT Office of Inspector General has been involved in investigating financial fraud in the Disadvantaged Business Enterprise (DBE) Program. By conducting on-site evaluations of the DBE Program, FAA will proactively prevent fraud before it occurs. Over the past two years, FAA's performance in two initiatives (Managing Conflict and Changing FAA Demographics) has been rated "red" by the Departmental Office of Civil Rights (DOCR). While the government-wide Alternative Dispute Resolution (ADR) participation rate in FY 2006 was 44.58 percent, FAA's ADR participation was 19.86 percent. Its performance related to reducing the number of formal complaints filed has also been rated "red." Finally, FAA is "red" in the hiring of minorities, women, and people with disabilities based on the expected hiring rate for these occupations, according to civilian labor force statistics.	692	7
FAA Privacy Program The FAA requests $2,557,000 to hire seven FTE and obtain contract support to accelerate the activities needed to protect FAA information	2,557	7

	Dollars ($000)	FTE
assets from unauthorized disclosure and prevent data loss of privacy sensitive data and other types of personally identifiable information (PII). Under Federal law and regulation, the FAA is responsible for protecting the privacy of personally identifiable information PII, the loss or theft of which could result in significant harm to the individual, the FAA and its customers. This also includes complying with certain federal laws, including the Federal Information Security Management Act (FISMA), new OMB mandates, OST regulations, GAO and Congress.		
Automated Staffing and Application Process (ASAP) This funding is requested to expand the ASAP system's capabilities to more efficiently process the hiring of mission critical positions, including air traffic controllers and safety inspectors. The system provides a web-enabled, user friendly staffing solution to FAA's unique hiring process, with instant certification of qualified candidates for employment.	500	
Financial Systems Upgrades This funding is requested to perform system/software upgrades for new Common Government-wide Accounting Code (CGAC) and Oracle12.Financial Information Standards Office (FISO). CGAC will simplify the process of financing and accounting for interagency and public-private partnerships. By removing some major administrative obstacles to financing cross-agency initiatives, FAA will be able to use specialized expertise found elsewhere in government, while lending our talent and expertise to other agencies. Without financial system upgrades, these opportunities will be lost. The FISO upgrade will involve a complete system overhaul and require FAA to convert its financial data and re-implement the DELPHI system.	1,600	
Base Transfers		
Air Traffic Controller Hiring Support: A significant percentage of the air traffic controller workforce will become eligible to retire in the next decade. To address this challenge, FAA will hire approximately 17,000 new air traffic controllers over the next 10 years. The requirement to continue to support a significant amount of air traffic controller hiring will be on-going for a minimum of the next 10 years. In support of the air traffic controller hiring, ATO will transfer $331,000 and four FTEs to the Human Resource Management Office (HRMO) at the Aeronautical Center.	331	4
Automated Staffing and Application Process (ASAP) System Enhancements: To meet the demands of the Air Traffic Controller Workforce Plan, the Air Traffic Organization (ATO) must be able to efficiently hire and track new employees. Our corporate automated tool for hiring and tracking is ASAP. This system, based on changing requirements, must be refreshed and enhanced. To support this requirement, ATO will transfer $148,000 and one FTE to the Office of Human Resources.	148	1

	Dollars ($000)	FTE
Labor Relations Improvements: In FY 2006, FAA reallocated labor relations positions in each of our regional offices under the Assistant Administrator for Human Resources. This was part of a multi-phased effort to move toward a more corporate and consistent approach in carrying out labor relations responsibilities in a multi-union environment. In continuation of this effort, the Office of Aviation Safety will transfer $158,000 and one FTE to the Assistant Administrator for Human Resources in support of this labor relations goal.	158	1
Technical Library: The Air Traffic Organization will transfer $651,000 and two FTE to the Office of General Counsel. In addition to funding two FTE, funds in the amount of $429,060 for periodicals will also be reallocated. The transfer will reassign this administrative function to the most appropriate FAA organization.	651	2
Office of Audit and Evaluation: The FAA established the Office of Audit and Evaluation to oversee safety-related issues. Currently, FAA has several different programs and entry points for disclosures and recommendations on safety-related and personnel issues, including whistleblower issues. Establishment of this organization will centralize this safety-related oversight function. To establish this organization, the Offices of the Administrator, Associate Administrator for Aviation Safety, and Assistant Administrator for Financial Services will transfer $1,422,000 and 11 FTE to the Office of the General Counsel.	693	6
Panorama Business Views (PB Views): The FAA's Strategic and Business Planning efforts are now fully incorporated into the agency's management process. In order to manage the FAA's Strategic and Business Planning program, all Operations-funded Lines of Business and Staff Offices are transferring funds totaling $1,197,000 to the Office of Aviation Policy, Planning, and Environment in support of this agency-wide effort.	1,114	
Tech Ops Hiring: The Office of Human Resources has centralized all external hiring for field technicians in the Human Resource Management Division (HRMD) at the Aeronautical Center. The centralization of hiring will benefit the agency as it will streamline the coordination between ATO-W, AHR, Security, Aviation Medicine, and the FAA Academy, reducing hiring time and duplication efforts. In support of the centralization of ATO hiring, ATO is transferring	450	2

	Dollars ($000)	FTE
$450,000 and two FTE. This funding will cover not only compensation and benefits for the two FTE, but also contract support that provides administrative assistance.		
Office of Chief Counsel (AGC) Policy: The ATO will transfer five FTE and $2,000,000 to the Office of Chief Counsel. The positions are: Associate Chief Counsel for the Air Traffic Organization; three positions to support the ATO's Service Centers; two positions to assist the ATO in accomplishing its congestion management initiatives and assure agency compliance with environmental laws; and two positions to assist ATO in accomplishing its NextGen initiatives, including the necessary rulemaking and acquisition work required.	2,000	5
Emergency Communications: As a result of the reviews conducted by FAA in the wake of the September 11, 2001 attacks, the Office of Emergency Communications (AEO-400), in the Office of Safety and Hazardous Materials (ASH), has been tasked with consolidating management and programmatic control of all of FAA's emergency communications, and command and control infrastructure. AEO-400 was given the task to provide full life-cycle support of each of the functional locations it manages in order to effectively provide a location where FAA can provide essential services during a national crisis as directed in FAA Orders 1900.1 and 1010.1. To support this consolidation, in FY 2010 ATO will transfer $514,000 and five FTE to ASH.	514	5
FAA Historian: ATO will transfer one FTE and $184,000 for personnel, compensation, benefits, and associated costs to the Office of the General Counsel for the position of FAA Historian.	184	1
Acquisition Support (AMQ) to Franchise Fund: To improve financial management and metric based analysis of these services, AMQ will operate within the franchise fund environment. Customers receiving acquisition support from this group will benefit from the fee based arrangement that more accurately reflects service cost and will ultimately improve business quality. Realigning this activity will shift 59 positions from ARC direct appropriation to the Franchise Fund.	0	-59

Resource Summary

Staff Office Total

	FY 2008 Actual [1]	FY 2009 Enacted	Unavoidable Changes	Discretionary Changes	FY 2010 Request
Funding ($000)					
PC&B	311,591	335,172	21,285	4,442	360,899
Other Objects					
Travel/Transportation	14,388	12,117	1,484	-	13,601
Other Services	187,720	262,026	(7,150)	4,801	259,677
RCU [2]	144,482	138,138	10,074	-	148,212
Other [3]	18,947	18,001	1,537	-	19,537
Total	365,537	430,282	5,945	4,801	441,028
Total	**677,128**	**765,454**	**27,230**	**9,243**	**801,927**
Staffing					
EOY (FTP)	2,525	2,692	(4)	29	2,717
OTFTP	90	87	-	-	87
Total FTEs (Includes FTP and OTFTP)	2,575	2,766	(8)	29	2,787

Resource Summary

ABA

	FY 2008 Actual [1]	FY 2009 Enacted	Unavoidable Changes	Discretionary Changes	FY 2010 Request
Funding ($000)					
PC&B	17,524	20,929	1,257	-	22,186
Other Objects					
Travel/Transportation	221	185	55	-	240
Other Services	74,222	86,068	(5,478)	1,600	82,190
RCU [2]	6,439	294	5,206	-	5,500
Other [3]	1,720	3,528	37	-	3,565
Total	82,602	90,075	(180)	1,600	91,495
Total	**100,126**	**111,004**	**1,077**	**1,600**	**113,681**
Staffing					
EOY (FTP)	126	163	(1)	-	162
OTFTP	-	-	-	-	-
Total FTEs (Includes FTP and OTFTP)	121	163	(1)	-	162

1 FY 2008 derived from actual obligations.

2 Rents, Communications, Utilities.

3 Printing & Reproduction Services, Supplies & Materials, Equipment, Land & Structures, and Insurance Claims & Indemnities.

Resource Summary

AHR

	FY 2008 Actual [1]	FY 2009 Enacted	Unavoidable Changes	Discretionary Changes	FY 2010 Request
Funding ($000)					
PC&B	64,235	68,065	3,684	-	71,749
Other Objects					
Travel/Transportation	2,256	1,462	3	-	1,465
Other Services	20,194	22,975	146	500	23,621
RCU [2]	211	211	1	-	212
Other [3]	4,002	3,378	3	-	3,381
Total	26,662	28,026	153	500	28,679
Total	**90,897**	**96,091**	**3,837**	**500**	**100,428**
Staffing					
EOY (FTP)	565	587	8	-	595
OTFTP	33	32	-	-	32
Total FTEs (Includes FTP and OTFTP)	596	616	8	-	624

Resource Summary

ARC

	FY 2008 Actual [1]	FY 2009 Enacted	Unavoidable Changes	Discretionary Changes	FY 2010 Request
Funding ($000)					
PC&B	88,171	94,117	3,121	-	97,238
Other Objects					
Travel/Transportation	5,412	5,041	167	-	5,208
Other Services	49,265	88,980	2,951	-	91,931
RCU [2]	135,681	135,605	4,497	-	140,102
Other [3]	7,792	7,257	241	-	7,498
Total	198,150	236,883	7,856	-	244,739
Total	**286,321**	**331,000**	**10,977**	**-**	**341,977**
Staffing					
EOY (FTP)	776	839	(59)	-	780
OTFTP	25	29	-	-	29
Total FTEs (Includes FTP and OTFTP)	789	881	(59)	-	822

1 FY 2008 derived from actual obligations.

2 Rents, Communications, Utilities.

3 Printing & Reproduction Services, Supplies & Materials, Equipment, Land & Structures, and Insurance Claims & Indemnities.

Resource Summary

AIO

	FY 2008 Actual [1]	FY 2009 Enacted	Unavoidable Changes	Discretionary Changes	FY 2010 Request
Funding ($000)					
PC&B	13,602	14,729	66	1,077	15,872
Other Objects					
Travel/Transportation	1,035	1,019	302	-	1,321
Other Services	22,261	29,061	(66)	1,480	30,474
RCU [2]	6	226	286	-	513
Other [3]	1,464	1,465	133	-	1,598
Total	24,766	31,771	655	1,480	33,906
Total	**38,368**	**46,500**	**721**	**2,557**	**49,778**
Staffing					
EOY (FTP)	93	95	2	7	104
OTFTP	4	6	-	-	6
Total FTEs (Includes FTP and OTFTP)	92	95	2	7	104

Resource Summary

AOA

	FY 2008 Actual [1]	FY 2009 Enacted	Unavoidable Changes	Discretionary Changes	FY 2010 Request
Funding ($000)					
PC&B	3,298	3,951	(435)	-	3,516
Other Objects					
Travel/Transportation	91	95	8	-	103
Other Services	460	476	(10)	-	466
RCU [2]	42	25	13	-	38
Other [3]	73	75	8	-	83
Total	666	671	18	-	689
Total	**3,964**	**4,622**	**(417)**	**-**	**4,205**
Staffing					
EOY (FTP)	22	24	(4)	-	20
OTFTP	4	4	-	-	4
Total FTEs (Includes FTP and OTFTP)	26	28	(4)	-	24

[1] FY 2008 derived from actual obligations.

[2] Rents, Communications, Utilities.

[3] Printing & Reproduction Services, Supplies & Materials, Equipment, Land & Structures, and Insurance Claims & Indemnities.

Resource Summary

ACR

	FY 2008 Actual [1]	FY 2009 Enacted	Unavoidable Changes	Discretionary Changes	FY 2010 Request
Funding ($000)					
PC&B	8,234	8,351	352	692	9,395
Other Objects					
Travel/Transportation	528	382	23	-	405
Other Services	394	1,130	(78)	-	1,052
RCU [2]	39	30	-	-	30
Other [3]	137	65	30	-	95
Total	1,098	1,607	(25)	-	1,582
Total	**9,332**	**9,958**	**327**	**692**	**10,977**
Staffing					
EOY (FTP)	68	74	7	-	81
OTFTP	6	4	-	-	4
Total FTEs (Includes FTP and OTFTP)	73	78	7	-	85

Resource Summary

AGI

	FY 2008 Actual [1]	FY 2009 Enacted	Unavoidable Changes	Discretionary Changes	FY 2010 Request
Funding ($000)					
PC&B	1,395	1,476	57	-	1,533
Other Objects					
Travel/Transportation	16	17	-	-	17
Other Services	15	17	-	-	17
RCU [2]	15	16	-	-	16
Other [3]	14	14	-	-	14
Total	61	63	-	-	63
Total	**1,456**	**1,539**	**57**	**-**	**1,596**
Staffing					
EOY (FTP)	9	12	-	-	12
OTFTP	2	-	-	-	-
Total FTEs (Includes FTP and OTFTP)	11	12	-	-	12

1 FY 2008 derived from actual obligations.

2 Rents, Communications, Utilities.

3 Printing & Reproduction Services, Supplies & Materials, Equipment, Land & Structures, and Insurance Claims & Indemnities.

Resource Summary

AOC

	FY 2008 Actual [1]	FY 2009 Enacted	Unavoidable Changes	Discretionary Changes	FY 2010 Request
Funding ($000)					
PC&B	4,980	5,366	191	-	5,557
Other Objects					
Travel/Transportation	65	78	-	-	78
Other Services	1,031	1,110	2	-	1,112
RCU [2]	51	55	-	-	55
Other [3]	139	90	-	-	90
Total	1,285	1,333	2	-	1,335
Total	**6,265**	**6,699**	**193**	**-**	**6,892**
Staffing					
EOY (FTP)	32	34	-	-	34
OTFTP	1	1	-	-	1
Total FTEs (Includes FTP and OTFTP)	34	34	-	-	34

Resource Summary

AGC

	FY 2008 Actual [1]	FY 2009 Enacted	Unavoidable Changes	Discretionary Changes	FY 2010 Request
Funding ($000)					
PC&B	33,725	37,039	4,156	-	41,195
Other Objects					
Travel/Transportation	854	648	202	-	850
Other Services	3,471	5,566	616	-	6,182
RCU [2]	110	110	2	-	112
Other [3]	739	212	651	-	863
Total	5,173	6,536	1,471	-	8,007
Total	**38,898**	**43,575**	**5,627**	**-**	**49,202**
Staffing					
EOY (FTP)	240	242	33	-	275
OTFTP	8	9	-	-	9
Total FTEs (Includes FTP and OTFTP)	238	246	29	-	275

[1] FY 2008 derived from actual obligations.

[2] Rents, Communications, Utilities.

[3] Printing & Reproduction Services, Supplies & Materials, Equipment, Land & Structures, and Insurance Claims & Indemnities.

Resource Summary

AEP

	FY 2008 Actual [1]	FY 2009 Enacted	Unavoidable Changes	Discretionary Changes	FY 2010 Request
Funding ($000)					
PC&B	11,032	11,751	474	960	13,185
Other Objects					
Travel/Transportation	155	155	50	-	205
Other Services	1,935	1,703	1,075	921	3,699
RCU [2]	36	36	-	-	36
Other [3]	177	152	-	-	152
Total	2,303	2,046	1,125	921	4,092
Total	**13,334**	**13,797**	**1,599**	**1,881**	**17,277**
Staffing					
EOY (FTP)	84	82	5	8	95
OTFTP	1	1	-	-	1
Total FTEs (Includes FTP and OTFTP)	85	83	5	8	96

Resource Summary

API

	FY 2008 Actual [1]	FY 2009 Enacted	Unavoidable Changes	Discretionary Changes	FY 2010 Request
Funding ($000)					
PC&B	10,637	11,063	171	-	11,234
Other Objects					
Travel/Transportation	1,401	1,304	(66)	-	1,239
Other Services	3,184	5,019	287	-	5,306
RCU [2]	323	405	13	-	418
Other [3]	451	116	10	-	127
Total	5,359	6,845	244	-	7,089
Total	**15,995**	**17,908**	**415**	**-**	**18,323**
Staffing					
EOY (FTP)	57	62	-	-	62
OTFTP	4	1	-	-	1
Total FTEs (Includes FTP and OTFTP)	62	65	-	-	65

1 FY 2008 derived from actual obligations.

2 Rents, Communications, Utilities.

3 Printing & Reproduction Services, Supplies & Materials, Equipment, Land & Structures, and Insurance Claims & Indemnities.

Resource Summary

ASH

	FY 2008 Actual [1]	FY 2009 Enacted	Unavoidable Changes	Discretionary Changes	FY 2010 Request
Funding ($000)					
PC&B	54,759	58,335	8,191	1,713	68,239
Other Objects					
Travel/Transportation	2,355	1,732	741	-	2,473
Other Services	11,288	19,922	(6,594)	300	13,629
RCU [2]	1,529	1,124	56	-	1,180
Other [3]	2,240	1,647	423	-	2,071
Total	17,413	24,426	(5,374)	300	19,352
Total	**72,172**	**82,761**	**2,817**	**2,013**	**87,591**
Staffing					
EOY (FTP)	453	478	5	14	497
OTFTP	2	-	-	-	-
Total FTEs (Includes FTP and OTFTP)	448	465	5	14	484

1 FY 2008 derived from actual obligations.

2 Rents, Communications, Utilities.

3 Printing & Reproduction Services, Supplies & Materials, Equipment, Land & Structures, and Insurance Claims & Indemnities.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

For necessary expenses, not otherwise provided for, for acquisition, establishment, technical support services, improvement by contract or purchase, and hire of National Airspace Systems and experimental facilities and equipment, as authorized under part A of subtitle VII of title 49, United States Code, including initial acquisition of necessary sites by lease or grant; engineering and service testing, including construction of test facilities and acquisition of necessary sites by lease or grant; construction and furnishing of quarters and related accommodations for officers and employees of the Federal Aviation Administration stationed at remote localities where such accommodations are not available; and the purchase, lease, or transfer of aircraft from funds available under this heading; to be derived from the Airport and Airway Trust Fund, $2,925,202,000, of which $2,455,202,000, shall remain available until September 30, 2012, and of which $470,000,000 shall remain available until September 30, 2010: *Provided*, That there may be credited to this appropriation funds received from States, counties, municipalities, other public authorities, and private sources, for expenses incurred in the establishment and modernization of air navigation facilities: *Provided further*, That upon initial submission to the Congress of the fiscal year 2011 President's budget, the Secretary of Transportation shall transmit to the Congress a comprehensive capital investment plan for the Federal Aviation Administration which includes funding for each budget line item for fiscal years 2011 through 2015, with total funding for each year of the plan constrained to the funding targets for those years as estimated and approved by the Office of Management and Budget.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)
Program and Financing
(in millions of dollars)

Identification code: 69-8107-0-7-402		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Obligations by program activity:			
	Direct program:			
00.01	Engineering, development, test and evaluation	333	308	474
00.02	Procurement and modernization of (ATC) facilities and equipment	1,379	1,622	1,661
00.03	Procurement and modernization of non-ATC facilities and equipment	168	121	133
00.04	Mission support	241	257	264
00.05	Personnel and related expenses	453	461	470
01.00	Subtotal, direct program	2,574	2,769	3,002
09.01	Reimbursable program	63	140	140
10.00	Total new obligations	2,637	2,909	3,142
	Budgetary resources available for obligation:			
21.40	Unobligated balance carried forward, start of year	1,037	1,016	989
22.00	New budget authority (gross)	2,556	2,882	3,065
22.10	Resources available from recoveries of prior year obligations	91	.....	.....
22.23	Expired unobligated balance transfer to unexpired account	.....	.....	.....
23.90	Total budgetary resources available for obligation	3,684	3,898	4,054
23.95	Total new obligations	-2637	-2,909	-3,142
23.98	Unobligated balance expiring or withdrawn	-31	.....	.....
24.40	Unobligated balance carried forward, end of year	1,016	989	912
24.41	Special and trust fund receipts returned to Schedule N	42	.....	.....
24.51	Expired unobligated balance carried forward, start of year (special and trust funds)	80	.....	.....
	New budget authority (gross), detail:			
	Discretionary:			
40.26	Appropriation (trust fund)	2,514	2,742	2,925
58.00	Spending authority from offsetting collections: Offsetting collections (cash)	57	140	140
58.10	Change in uncollected customer payment for Federal sources (unexpired)	-15	.....	.....
58.90	Spending authority from offsetting collections (total discretionary)	42	140	140
69.00	Mandatory: Offsetting collections (cash)	.....	.....	.....
70.00	Total new budget authority (gross)	2,556	2,882	3,065
	Change in obligated balances:			
72.40	Obligated balance, start of year:	1,801	1,785	1,794
73.10	Total new obligations	2,637	2,909	3,142
73.20	Total outlays (gross)	-2,560	-2,900	-2,854
73.40	Adjustments in expired accounts (net)	-50	.....	.....
73.45	Recoveries of prior year obligations	-91	.....	.....
74.00	Change in uncollected customer payment for Federal sources (unexpired)	15	.....	.....
74.10	Change in uncollected customer payment for Federal sources (expired)	33	.....	.....
74.40	Obligated balance, end of year	1,785	1,794	2,082
	Outlays (gross), detail:			
86.90	Outlays from new discretionary authority	1,005	1,276	1,339
86.93	Outlays from discretionary balances	1,552	1,600	1,492
86.98	Outlays from mandatory balances	3	24	23
87.00	Total outlays (gross)	2,560	2,900	2,854
	Offsets:			
	Against gross budget authority and outlays:			
	Offsetting collections (cash) from:			
88.00	Federal sources	-32	-47	-47
88.40	Non-Federal sources	-70	-93	-93
88.90	Total, offsetting collections (cash)	-102	-140	-140
	Against gross budget authority only:			
88.95	Change in uncollected customer payments from Federal sources (unexpired)	15	.....	.....
88.96	Portion of offsetting collections (cash) credited to expired accounts	45	.....	.....
	Net budget authority and outlays			
89.00	Budget authority	2,514	2,742	2,925
90.00	Outlays	2,458	2,760	2,714

Funding in this account provides for the deployment of communications, navigation, surveillance, and related capabilities within the National Airspace System (NAS). This includes funding for several activities of the Next Generation Air Transportation System, a joint effort between the FAA, NASA, and the Departments of Defense, Homeland Security and Commerce to improve the safety, capacity, security, and environmental performance of the NAS. As the organization primarily responsible for air traffic infrastructure, the Air Traffic Organization receives and manages 95 percent of the funding in this account. The funding request for FY 2010 supports FAA's comprehensive plan for modernizing, maintaining, and improving air traffic control and airway facilities services.

Object Classification

(in millions of dollars)

Identification code: 69-8107-0-7-402		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Direct obligations:			
	Personnel compensation:			
11.11	Full-time permanent	280	323	325
11.13	Other than full-time permanent	3	4	4
11.15	Other personnel compensation	8	9	9
11.19	Total personnel compensation	291	336	338
11.21	Civilian personnel benefits	72	75	76
12.10	Travel and transportation of persons	36	35	35
12.20	Transportation of things	3	3	3
12.32	Rental payments to others	30	32	34
12.33	Communications, utilities, and miscellaneous charges	36	38	41
12.40	Printing and reproduction		1	1
12.52	Other services	1,635	1,748	1,937
12.60	Supplies and materials	38	40	43
13.10	Equipment	272	290	310
13.20	Land and structures	156	166	178
14.10	Grants, subsidies, and contributions	5	5	6
19.90	Subtotal, direct obligations	2,574	2,769	3,002
29.90	Reimbursable obligations	63	140	140
99.99	Total new obligations	2,637	2,909	3,142

Employment Summary

Identification code: 69-8107-0-7-402		FY 2008 Actual	FY 2009 Enacted	FY 2010 Estimate
	Direct			
1001	Civilian full-time equivalent employment	2,643	2,831	2,831
	Reimbursable			
2001	Civilian full-time equivalent employment	48	55	55

EXHIBIT III-1
FACILITIES & EQUIPMENT
SUMMARY BY PROGRAM ACTIVITY
Appropriations, Obligations Limitations, and Exempt Obligations
($000)

	FY 2008 Actual	FY 2009 Enacted (Omnibus)	FY 2009 Enacted (Total)*	FY 2010 Request	Change FY 2009-2010
Engineering, Development, Test and Eval.	307,478	345,100	345,100	523,914	178,814
Air Traffic Control Facilities and Eqpt.	1,395,662	1,568,290	1,768,290	1,570,871	2,581
Non-Air Traffic Control Facilities and Eqpt.	131,743	141,800	141,800	130,417	(11,383)
Facilities and Equipment Mission Support	218,755	226,405	226,405	230,000	3,595
Personnel and Related Expenses	459,973	460,500	460,500	470,000	9,500
TOTAL	**2,513,611**	**2,742,095**	**2,942,095**	**2,925,202**	**183,107**
FTEs					
Direct Funded	2,643	2,831	2,831	2,831	0
Reimbursable	48	55	55	55	0

Program and Performance Statement

This account provides funds for programs that improve operational efficiency, constrain costs, modernize automation and communication technology and systems, and deal with aging facilities. Particular emphasis is placed on en route and terminal air traffic control, satellite navigation and landing systems, and communications.

Funding is organized within the following activity areas of FAA:

Activity 1: Engineering, development, test and evaluation;

Activity 2: Procurement and modernization of air traffic control facilities and equipment; procurement and modernization on non-air traffic control facilities and equipment;

Activity 3: Procurement and modernization of non-Air Traffic Control facilities and equipment; and

Activity 4: Facilities and equipment mission support.

As the organization primarily responsible for air traffic infrastructure, the performance based Air Traffic Organization (ATO) receives and manages 95 percent of the funding in this account. The remaining 5 percent of the funding is for Aviation Safety (AVS), Information Services (AIO), and Regions and Centers (ARC).

* Includes funding provided by the American Recovery and Reinvestment Act of 2009. This act provides supplemental funding of $200 million to Facilities and Equipment and $1.1 billion Grants-in-Aid for Airports.

EXHIBIT III-2
FACILITIES & EQUIPMENT
SUMMARY ANALYSIS OF CHANGE FROM FY 2009 TO FY 2010
Appropriations, Obligation Limitations, and Exempt Obligations

Item	Change from FY 2009 to FY 2010	FY 2010 PC&B by Program	FY 2010 FTEs by Program	FY 2010 Contract Expenses	Total
		Note Columns are Non-Add			
FY 2009 Base					
Facilities & Equipment Appropriations, Obligations, Limitations, and Exempt Obligations		**411,000**	**2,831**	**1,721,364**	**$2,742,095**
Adjustments to Base					
Annualized FY 2009 Pay Raise (GS Population)	3,253	3,253			
Annualized FY 2009 Pay Raise (Core Comp Population)	813	813			
FY 2010 Pay Raise (GS Population)	5,228	5,228			
FY 2010 OSI (Core Comp Population)					
FY 2010 SCI					
Non-pay Inflation	173,812		0	134,432	
Subtotal, Adjustments to Base	**183,107**	**9,295**	**0**	**$134,432**	**$183,107**
New or Expanded Programs					
Engineering, Development, Test and Evaluation					
Air Traffic Control Facilities and Equipment					
Non-Air Traffic Control Facilities and Equipment					
Facilities and Equipment Mission Support					
Personnel & Related Expenses					
Subtotal, New or Expanded Programs	**$0**	**$0**	**0**	**$0**	**$0**
Total FY 2010 Request	**$183,107**	**$420,295**	**2,831**	**$1,855,796**	**$2,925,202**

For FY 2010, the funding request is in accordance with the Federal Aviation Administration's comprehensive plan for modernizing and improving the National Airspace System. The Facilities and Equipment (F&E) budget request contains projects from the agency's Capital Investment Plan (CIP) that are required to update and maintain the air traffic control system. The requested funding would finance programs that maximize operational efficiency, constrain costs, modernizing automation and communications technology, and systems and deal with aging facilities. Particular emphasis is placed on the Next Generation Transportation System (NextGen) and supporting programs.

The FY 2010 request continues to support the Next Generation Air Transportation System (NextGen), by providing new transformational capabilities or by contributing to the broader NextGen effort by creating a modern platform on which to establish future capabilities.

This budget request is organized according to the following FAA activity areas: engineering, development, test and evaluation; procurement and modernization of air traffic control facilities and equipment; procurement and modernization of non-air traffic control facilities and equipment; and facilities and equipment mission support. As the organization primarily responsibility for air traffic infrastructure, the Air Traffic Organization receives and manages 95 percent of the funding in this account.

Activity 1, Engineering, Development, Test and Evaluation

Activity 2, Procurement and Modernization of Air Traffic Control Facilities and Equipment

a. En Route Programs

b. Terminal Programs

c. Flight Service Programs

2C01	Automated Surface Observing System (ASOS)	$5,500,000	160
2C02	Flight Service Station (FSS) Modernization	$20,100,000	162
2C03	Weather Camera Program	$3,800,000	164

d. Landing and Navigational Aids Program

2D01	VHF Omnidirectional Radio Range (VOR) with Distance Measuring Equipment (DME)	$5,000,000	166
2D02	Instrument Landing System (ILS) – Establish	$8,600,000	168
2D03	Wide Area Augmentation System (WAAS) for GPS	$97,400,000	171
2D04	Runway Visual Range (RVR)	$5,000,000	175
2D05	Approach Lighting System Improvement Program (ALSIP)	$8,700,000	177
2D06	Distance Measuring Equipment (DME)	$6,000,000	179
2D07	Visual Navaids – Establish/Expand	$3,700,000	181
2D08	Instrument Flight Procedures Automation (IFPA)	$7,900,000	183
2D09	Navigation and Landing Aids – Service Life Extension Program (SLEP)	$6,000,000	186
2D10	VASI Replacement – Replace with Precision Approach Indicator	$4,000,000	188
2D11	Global Positioning System (GPS) Civil Requirements	$43,400,000	190

e. Other ATC Facilities Programs

2E01	Fuel Storage Tank Replacement and Monitoring	$6,200,000	192
2E02	Unstaffed Infrastructure Sustainment	$18,200,000	194
2E03	Aircraft Related Equipment Program	$10,000,000	196
2E04	Airport Cable Loop Systems – Sustained Support	$6,000,000	199
2E05	Alaskan NAS Interfacility Communications System (ANICS)	$9,000,000	201
2E06	Facilities Decommissioning	$5,000,000	203
2E07	Electrical Power System – Sustain/Support	$101,000,000	205
2E08	Aircraft Fleet Modernization	$5,969,000	208

Total, Activity 2 **$1,570,871,000**

Activity 3, Procurement and Modernization of Non-Air Traffic Control Facilities and Equipment

a. Support Programs

3A01	Hazardous Materials Management	$20,000,000	210
3A02	Aviation Safety Analysis System (ASAS)	$10,500,000	212
3A03	Logistics Support System and Facilities (LSSF)	$9,300,000	215
3A04	National Air Space Recovery Communications (RCOM)	$10,230,000	217
3A05	Facility Security Risk Management	$18,000,000	219
3A06	Information Security	$12,276,000	221
3A07	System Approach for Safety Oversight (SASO)	$20,000,000	225
3A08	Aviation Safety Knowledge Management Environment (ASKME)	$8,100,000	227

b. Training, Equipment and Facilities

3B01	Aeronautical Center Infrastructure Modernization	$13,810,500	232
3B02	Distance Learning	$1,500,000	234
3B03	NAS Training Facilities – Simulator	$6,700,000	237

Total, Activity 3 **$130,416,500**

Activity 4, Facilities and Equipment Mission Support

a. System Support and Support Services

4A01	System Engineering and Development Support	$31,700,000	238
4A02	Program Support Leases	$37,500,000	240
4A03	Logistics Support Services (LSS)	$11,000,000	242
4A04	Mike Monroney Aeronautical Center Leases	$16,200,000	243
4A05	Transition Engineering Support	$15,000,000	245
4A06	Frequency and Spectrum Engineering	$3,600,000	247
4A07	Technical Support Services Contract (TSSC)	$22,000,000	249
4A08	Resource Tracking Program (RTP)	$4,000,000	250
4A09	Center for Advanced Aviation System Development (CAASD)	$79,000,000	252
4A10	Aeronautical Information Management Program	$10,000,000	256
	Total, Activity 4	**$230,000,000**	

Activity 5, Personnel Compensation, Benefits, and Travel

5A01	Personnel and Related Expenses	$470,000,000	226

Total, All Activities	**$2,925,202,000**

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A01	**Advanced Technology Development and Prototyping**	**$41,800,000**	**Various**	**A-28, M-08, M-46, M-47, S-09, W-10**

FAA Strategic Goals: Increased Safety – To achieve the lowest possible accident rate and constantly improve safety. Objective 1 - Reduce commercial air carrier fatalities; Objective 2 - Reduce the number of fatal accidents in general aviation; and Objective 3 - Reduce the risk of runway incursions.

Greater Capacity: Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Organizational Excellence – Ensure the success of the FAA's mission through stronger leadership, a better trained and safer workforce, enhanced cost-control measures, and improved decision-making based on reliable data. Objective 4 - Make decisions based on reliable data to improve our overall performance and customer satisfaction.

Description of Problem: The FAA's mission is to provide the safest and most efficient aerospace system in the world. As the leading authority in the international aerospace community, FAA is responsive to the dynamic nature of customer needs and economic conditions. A key element of this mission is the safe and efficient use of airspace. To accomplish this mission, FAA's Advanced Technology Development and Prototyping program develops and validates technology and systems that support air traffic services. These initiatives support the goals, strategies, and initiatives of the agency's Flight Plan, including the requirements associated with the evolving air traffic system architecture and improvements in airport safety and capacity.

For FY 2010, $41,800,000 is requested for the following activities:

1. Runway Incursion Reduction Program (RIRP) - ATDP - ($10,000,000):

Description of Solution: Reducing the risk of runway incursions is a key FAA safety goal and remains on the National Transportation Safety Board's (NTSB) "Most Wanted" list of critical safety issues. During 2007, FAA convened aviation industry stakeholders to a "Call to Action" session to establish near, mid and long-term action plans to mitigate the continuing risk of runway incursions. Several areas of increased technology development emphasis emerged from that session, with the RIRP remaining the principal vehicle for initial development, demonstration, evaluation and establishment of implementation programs for these initiatives. The reduction of high-hazard runway incursions remains the key safety objective as specified in FAA's Flight Plan. The RIRP will remain the catalyst to initiate acquisition activities to facilitate transition of promising safety technologies that have reached a level of maturity deemed appropriate for NAS transition and implementation.

The requested funds support delivery of performance targets outlined in the FAA Flight Plan and ATO Safety Business Plan. Specifically, the funds will support (1) completion of Low Cost Ground Surveillance (LCGS) pilot program operational trials and the transition from the pilot to a national implementation program; (2) completion of the Runway Intersection Lights operational trials, (3) development of a low cost runway status lights (RWSL) system design for application at non-ASDE-X airports; (4) development of automated taxiway guidance concepts; (5) evaluation of LED technology for application in runway safety systems and (6) evaluation of airport wireless data communications system design alternatives.

Benefits: The demonstration, evaluation and transition of mature runway safety technologies will reduce the incidence of high-hazard (Category A/B) incursion and ultimately reduce the risk of a runway collision. Early development, testing and maturation of viable technologies result in reduced technical, cost and acquisition schedule risk, with early delivery of runway safety benefits.

2. System Capacity, Planning, and Improvements - ATDP ($4,100,000):

Description of Solution: The program will provide data which will be used to develop and analyze airport solution sets contained in the NextGen Implementation Plan; implement the performance-based navigation roadmap by developing Area Navigation (RNAV) and Required Navigation Performance (RNP) routes and procedures; and support the 35 OEP airports' master plans for airfield improvement. Additional studies will analyze the effects of new equipment, technology, and high altitude airspace redesign on delays and congestion. These efforts will be sustained by the use of the Performance Data Analysis and Reporting System (PDARS), Design Team Studies, and Capacity and International Benchmark reports. U.S. aviation policy objectives will be furthered by means of participation in international organizations such as the Civil Air Navigation Services Organization (CANSO) and ICAO. PDARS Staffing Analysis will be used by FAA decision-makers to effectively and efficiently operate with a better prepared, better trained, safer, diverse workforce. These programs collectively drive the achievement of the Office's mission and its support of the Agency.

Benefits: Capacity studies identify the operational benefits and delay-reduction cost savings of capacity enhancement alternatives. Program output includes: flight operational data for use in performance analysis; system safety, delay, flexibility, predictability, and user access performance measures on a daily basis; and travel times within geometric areas and for route segments (arrival fix to runway, runway to departure fix, etc.). Output also includes methodologies and prototypes for measuring the benefits of airport, airspace, and procedural enhancements. PDARS is the Air Traffic Control System Command Center's (ATCSCC) primary tool for accessing radar data and provides an objective tool for operational planning, assessment and support of flow management initiatives. Integration of PDARS with Airport Surface Detection Equipment (ASDE-X); Out, Off, On, and In time (OOOI) data; restrictions data; and playbook scenarios will help to reduce ground delays. These enhancements, which encompass the final phase of PDARS development and are an ATO community requirement, are critical for analyzing surface operations and baselining OEP performance. PDARS is a well-accepted and often-used tool at all major ATC facilities. The impact will be realized on assessments of such issues as wake turbulence mitigation, New Large Aircraft (NLA), Very Light Jets (VLJs), reduced separation criteria, and alternative flow management methods.

3. Operations Concept Validation - ATDP ($8,000,000):

Description of Solution: The project objective is to provide a well-defined and well-understood "validated" operational concept based on system modeling and simulation. This work evaluates and incorporates lessons learned from the recent delivery of decision support tools to provide guidance on how advanced decision support and operational enhancements will be integrated into the NAS. The program develops and exercises advanced analysis capabilities to consider the benefit and operational feasibility of the supported procedural changes. In particular, the program is analyzing the methods for "genericizing" controller areas of specialty recognizing differences between high and low altitude work, opportunities to use multi-sector planners, and the expanded role of Traffic Flow Managers in managing airspace capacity versus limiting demand. It is looking at new ways of providing tower services to enhance tower operations under low visibility conditions. It looks at leveraging automation to change roles and responsibilities of NAS airspace users and service providers. Simulation and human-in-the-loop experimentation are used to integrate this new guidance revealing the type, update rate, and display requirements that need to be established to ensure optimum controller performance. The work program has three thrusts: ·Operational Concept Development, Concept Validation, and Concept System Design.

Operational Concept Development extends the high level concept of operations and the early validation efforts into detailed concepts of operation for the evolution of Air Traffic Management. Efforts include development of concepts for domains, phase of flight and concepts of use for individual systems as well as classes of enablers such as surveillance. The activity includes interaction with RTCA's Working Groups and the Joint Program Development Office (JPDO) to ensure the concepts are acceptable to the community (as well as providing the FAA's contribution to RTCA funding from this line). The ATS concepts are used extensively in activities such as enterprise architecture, initial and final requirement documents (e.g., ERAM, TFM-M, ADS-B and New Voice Switch) and in investment analysis (the Portfolio activity). The concepts are also used within the ICAO ATM Concept Panel in an effort to keep the global concept, ICAO Standards and Recommended Practices (SARPs) and planning attuned to the U.S. objectives for modernization.

Concept Validation efforts provide the performance requirements for information management to support the tactical and strategic common situational awareness assumptions and needs of the next generation of ground and airborne support systems, including weather and traffic information distribution. The Operational Concept Validation efforts extend the identification of information type, update rate, and display requirements to decision support tools in general. The project extends the development of performance measures to validate the operational improvements of future concepts. Associated with the changes in roles and responsibilities are opportunities for restructuring the services provided by air traffic control facilities to best support the re-aligned roles of humans in the NAS as enabled by new automation and communication capabilities. Recent activities include analysis of common trajectory service and flight object for en route airspace, distributed air-ground information processing and sharing, and sensitivity analysis of trajectory services for decision support tools which may levy requirements on ERAM.

Concept System Designs assess the operational design implications of future concepts with respect to the type and immediacy of information. Activities include evolution of the en route controller task from active to monitor mode, the role of a strategic controller and its impact. Concept development and conceptual system design provide the basis for validation activities and the derivation of requirements.

The FY 2010 funding request will be used for concept development, concept validation, and requirements development for lower level NAS concepts, such as requirements development and transition planning for the Multi-Sector Planner concept, development of mid-term (2017) requirements for new high altitude concepts and concept validation of far term (2025) high altitude concepts, modeling and requirements analysis of flexible airspace concepts, concept validation of surface concepts, requirements development for Enhanced Visual Operations, and alternatives analysis and concept validation activities for flexible tower services. These activities will include validation of concepts for ground–ground and air-ground communications to support transfer of information and change the air traffic control paradigm, as well as to validate assumptions about flight deck evolution.

Benefits: The program uses analyses and associated white papers to validate whether future system requirements meet NextGen goals, including the flight data processing evolution in En Route Automation Modernization (ERAM), data communications, the future voice switch, changes in surveillance requirements and associated procedures, establishment of new roles and responsibilities to support increased productivity, etc. This supports the goal of continued U.S. leadership internationally and helps ensure the global harmonization through continued support for the ICAO Global ATM operational concept, the development of global requirements, and the definition of an air transportation performance framework.

4. NAS Weather Requirements ($1,000,000):

Description of Solution: One of FAA's top priorities is predicting and responding to weather. Weather has a significant impact on safety and efficiency and affects activities across all domains. The NAS Weather Group minimizes the negative impacts of weather on the NAS operations by increasing operational predictability during weather events (particularly during winter weather and convective weather situations). The NAS Weather Group develops aviation weather policy and standards; represents FAA on the Joint Planning and Development Office (JPDO) Weather Integrated Planning Team; and manages the research, engineering, and development (R,E&D) and ATO Capital Activity 1 weather portfolio. The NAS Weather Group manages the NAS Requirements Development program to align requirements, priorities, programs, and resources and develops metrics to understand the impacts of weather on the NAS. The program creates strategic plans and defines weather requirements, and policy and standards. FAA is the Meteorology Authority for the U.S. under the International Civil Aviation organization (ICAO). On behalf of FAA, the NAS Weather Group provides national and international leadership to optimize aviation weather systems and services by establishing consensus and cooperation within FAA and between government agencies, private weather services, research organizations and user groups on aviation weather requirements and priorities.

The requested funds will continue the contract support that provides a flexible means to direct attention and resources to concerns affecting safety, system efficiency and international leadership, changing focus as needs develop. This funding will be used to address problems in each of these three areas:

- Requirements. Analysis and technical planning support work to develop mission analysis, functional analysis, functional requirements, and performance requirements for NAS users.

- International. Promote current U.S and NextGen solution sets at the ICAO to realize global harmonization and accelerate change. FAA is the Meteorology Authority for the U.S. under ICAO. As such, the Weather Office provides national and international leadership to both reduce the differences between the US and ICAO and to more closely align ICAO standards with NextGen standards. Provides the technical support and analysis necessary to reduce differences and align standards with the NextGen concept.
- Strategic Direction. Develop aviation weather requirements that align with NextGen requirements, including establishing research and development requirements for weather capabilities that will meet future NextGen requirements. Negotiate with other agencies for cost-sharing for NextGen investments. Work with the developers of decision support tools to integrate weather information into those tools. Provides the analytical and technical support not available within FAA to develop the strategic direction for the use of aviation weather capabilities.

Benefits: A large amount of work accomplished by the program is geared toward the movement of aviation weather products, including safety risk management functions from R&D into operational use. Accomplishment of the work in this budget line will allow:

- Increased RE&D/F&E Activity-1 productivity from better R&D priority management areas
- Improved weather information (observations/forecasts) for increased NAS operational safety, efficiency and capacity
- Consolidation of processors, resulting in reduced operating costs
- Open architecture enabling lowered development costs
- Reduced communications costs with simultaneous improvement in product access resulting from Network Enabled Operations
- Reduced equipage and training costs for air carriers resulting from closer conformance with global standards

5. Airspace Management Program (AMP) ($3,000,000):

Description of Solution: The goal of regional and national airspace redesign efforts is to address congestion and delays in our nation's busiest airports. We accommodate growth by enhancing the efficiency and reliability of the NAS. Airspace redesign efforts seek to optimize Terminal, En Route and Oceanic airspace by redesigning airspace in NY/NJ/PHL, Chicago Airspace Project (CAP), Western Corridor, Houston Area Air Traffic System (HAATS), and with HAAM. F&E funding is planned for NY/NJ/PHL, CAP, Western Corridor, High Altitude Airspace Management (HAAM) and national integration efforts of the program office. Airspace redesign efforts will modernize airspace in support the new flows associated with new runways in Chicago and in Las Vegas.

For FY 2010, Airspace Redesign requests $3,000,000 to provide the following:

- Infrastructure changes resulting from the airspace redesign supporting the Chicago and New York/Philadelphia metropolitan
- Infrastructure changes resulting from the airspace redesign supporting the Western Corridor project
- Infrastructure changes resulting from the airspace redesign supporting the High Altitude Airspace Management project
- Engineering analyses of operational feasibility of airspace concepts supporting transition to NextGen

Benefits: The airspace redesign projects supported by these FY 2010 F&E funds are projected to deliver as much as $121 million of direct operating cost benefits by 2015. These benefits are realized through the reduction of restrictions, shorter flight distances, more fuel efficient routes, and reduced delays. The most significant benefits will be in the key metropolitan areas. Airspace redesign in New York and Philadelphia metropolitan areas will reduce delays by 20 percent in the next 10 years, based on today's flight statistics. In Chicago, airspace redesign will ensure return on the runway investments. With airspace changes and the new runway, delays can be reduced by as much as 60 percent. Airspace redesign will also provide internal FAA benefits. Without airspace redesign, sector splitting and growth in the number of sectors will be the only methods to manage complexity and congestion, increasing operations costs by millions every year. Reducing the number of sectors in the HAAM program through standardization and reallocation of airspace boundaries could provide a minimum of $20 million of annual FAA cost savings.

6. ATO Strategy and Evaluation ($3,000,000):

Description of Solution: This program will develop two products to address the aforementioned problems:

- A new Airport Capacity Model to aid in the analysis of new airport capacity-related projects. The proposed model would address all of the shortfalls previously described, thereby facilitating rapid modeling of airport improvements, demand changes, and ATM technology insertions. In addition to being used by the Office of Performance Analysis and Strategy in runway capacity studies, the model would be used by ATO-F for investment analyses, the Joint Planning and Development Office (JPDO) for NextGen analyses, and the FAA's Office of Airports. The model could also be used by aviation consultants and the academic community, providing a de facto standard for airport capacity analysis.

- A new System-Wide NAS Model to replace the existing (and obsolete) National Airspace System Performance Capability (NASPAC)model. A new system-wide model is required to address the previously described shortfalls of NASPAC and to aid with investment analysis, performance analysis, development of the ATO business outlook, development of detailed forecasts, and other analytical activities. The new model would support the Office of Performance Analysis and Strategy, Office of Research and Technology Development (concept validation), ATO-F (investment analysis), and the JPDO. Additionally, the model could be used by FAA and NASA contractors and the academic community.

Benefits: This program will provide computational tools to identify and evaluate potential strategies, and to improve decision-making throughout FAA and the aviation community. For example, the Chicago O'Hare Modernization Project is estimated to cost about $7 billion. A new airport capacity model will help to ensure that this money is spent wisely and will reduce the cost of the required analyses. Also, the FAA's existing system-wide simulation model NASPAC cannot accommodate new ATM procedures planned for NextGen (such as Continuous Descent Approaches and 4D trajectories) or even existing Traffic Flow Management procedures (e.g., Ground Delay Programs, Airspace Flow Programs, time-based metering, Severe Weather Avoidance Programs, etc.). NASPAC is thus inadequate for assessing future NAS performance and the success of the Operational Evolution Partnership (OEP). A new system-wide model will address these shortcomings.

7. Dynamic Capital Planning ($1,500,000):

Description of Solution: The Dynamic Capital Planning tools will allow ATO to make optimal decisions based on best business practices and provide verification for our owners (DOT, OMB and Congress) of aggressive approval thresholds and management of the Capital programs. The requirements analysis for selecting Dynamic Capital planning tools is being evaluated through the ATO Office of Finance and includes tools to address the following focus areas: quantitative economic value and internal benefits validation; milestone tracking and schedule modeling; performance measurement; auditing and trend analysis; earned value through program life cycle; field implementation planning; and post-implementation analysis for corporate lessons learned results.

For FY 2010, $1,500,000 is requested for the following activities: implementation of the tool and continued support of program evaluation through all phases of the acquisition life cycles; contractor maintenance support, and updating documentation related to the tool.

Benefits: This program will allow the agency to better allocate resources and add management performance and accountability to the Capital program. The program will support the number of recommended actions to improve the management and performance of the Capital program by the Office of Management and Budget (OMB).

8. Wind Profiling and Weather Research Juneau ($1,100,000):

Description of Solution: An FAA report to Congress in February 1995 determined severe upper air turbulence and wind shear raised potential hazards for aircraft executing tight arrival and departure procedures in the Juneau, Alaska area. The report directed FAA to study the problem of wind shear, terrain-induced turbulence and intense horizontal and vertical rotors. After the study, the FAA Flight Standards group restricted flight operations for commercial carriers and required the development of a detailed "go-no-go" Operational Specification (OpSpec). To assist in providing the needed wind data for commercial carrier use to comply with the OpSpec, the Juneau Airport Wind System (JAWS) program was initiated in 1997. The prototype system has proven to provide increased capacity and safety for Juneau area flight operations activities.

Currently, JAWS is preparing a business case for the useful segment from FY 2010 – FY 2014 to deploy the end-state JAWS that includes acceptable technical, schedule and cost parameters. JAWS is an on-site system in Juneau, Alaska consisting of a wind sensors network to provide information on winds and turbulence. The system will include a basic anemometer network (initially developed by National Center for Atmospheric Research (NCAR) and Wind Profilers (vertical-looking radars) to increase situational awareness of winds up to 6,000 feet and to aid in providing turbulence alerts for a larger margin of safety. The prototype system will be transitioned to an end-state system that the FAA can safely incorporate into the NAS.

Benefits: The potential benefits of JAWS are categorized into safety benefits and capacity benefits. Three significant incidents involving transport aircraft that occurred during turning departures between 1993 and 1995 led to the implementation of wind restrictions and the need for JAWS. These wind restrictions along with additional routes have mitigated the safety risk significantly. In addition, general aviation users rely on JAWS for wind information and receive this information via the Juneau Automated Flight Service Station (AFSS) and National Weather Service.

The benefit of JAWS was derived from wind measurements providing the ability to conduct departures and arrivals that are wind-restricted or would otherwise be denied. The FAA tracks the number of Required Navigation Performance (RNP) operations that could not have been conducted via an alternative route. In addition, Alaska Airlines provided data as to the number of turning departures that were conducted. Estimates of 850 annual flight disruptions would be through the use of JAWS. This is a conservative number in that it applies only to flights that could not have operated on alternative route that do not require wind measurements. With additional research into a wind warning system, JAWS has the potential to address another 28-to-35 flights annually that are currently disrupted due to the adverse wind conditions.

9. Wake Turbulence ($1,000,000):

Description of Solution: For FY 2010, $1,000,000 is requested to provide prototype development, evaluation and requirements definition for the Wake Turbulence Mitigation for Arrivals (WTMA) air traffic control decision support tool. This work will lead to an FAA acquisition in FY 2013 to transform the capabilities of the prototype into functioning tools for use by the FAA air traffic controllers. The first operational benefit will be realized in FY 2015 when the system is first used in an operation setting. This solution will allow a reduction in the required diagonal wake turbulence separation distance to 1.5 NM or less when instrument operations are being conducted and there are favorable crosswinds. Under this standards two-to-four more arrival slots per hour would be possible at airport that uses closely spaced parallel runways for arrival operations and has a significant percentage of 757 and heavier aircraft traffic.

Benefits: Implementation of the Wake Mitigation for Arrivals (WTMA) air traffic control decision support tool at potentially 12-to-17 candidate airports that have a significant number of 757 and heavier aircraft operations and use closely-spaced parallel runways for arrival operations, would yield $20 million per year in aircraft operator cost savings. Savings come from maintaining a higher airport arrival rate than that is presently established when an airport is required by weather conditions to shift from capacity efficient visual landing operations to instrument landing system (ILS) operations. Under today's current closely-spaced parallel runway ILS operations, the aircraft spacings revert to those used for aircraft landing on a single runway, essentially cutting the landing capacity of the airport's closely spaced parallel runways in half. When crosswinds are present on the airport's approach corridor, WTMA would provide two-to-four additional arrival slots per hour for airports that are serving a significant number of 757 and heavier aircraft. WTMA will also provide Passenger Value of Time savings - estimated to be $25 million per year if implemented at 15 airports. Better definition of benefits will be a product of the WTMA evaluations that will be funded by this project. This initial benefit estimate was done jointly by the FAA Wake Turbulence Program Office and the associated NASA research organization as part of a process to develop potential solutions for reducing the required wake separations on ILS approaches to closely spaced parallel runways.

10. Traffic Collision and Avoidance System (TCAS) ($2,500,000):

Description of Solution: As new procedures are developed to support NextGen, collision avoidance will need to evolve to work in concert with these procedures. In the near term, minor changes to TCAS may be sufficient to support smaller, mid-term operational changes. However, it is likely that collision avoidance will evolve and become an integral part of an air-to-air systems capability; thus, the distinction between "collision avoidance" and "separation assurance" may become blurred as these systems evolve.

In FY 2009, the TCAS program will complete the implementation of a near term TCAS monitoring capability, implement a new US airspace model, and continue assisting AVS with necessary rulemaking for the potential upgrade of all existing TCAS II units. This will be followed by coordination with avionics manufacturers and airlines if upgrades are deemed necessary and mandated.

In FY 2010, the TCAS program will initiate the transitioning of TCAS 7.1 to an operational service unit and begin changing focus and direction towards addressing the future of TCAS within the NextGen portfolio. It will become part of the Safety, Security, and Environment Solution Set, as defined by the OEP. While new procedures are developed to support NextGen, collision avoidance needs to evolve so that the system works in concert with these procedures. It is likely that collision avoidance will evolve and become an integral part of an air-to-air systems capability. What will be needed are comprehensive assessments to prove that the overall operations are safe when performed in a manner consistent with the intended function of the equipment.

Areas to support development of the next generation collision avoidance system are outlined below:

- Define collision avoidance algorithm improvements to maintain an acceptable level of safety based on evolving airspace improvements, emerging weaknesses in the current design, and the introduction of new NextGen procedures.
- Research expected improvements by utilizing improved navigation and surveillance data sources.
- Continue to develop a TCAS monitoring capability and update the U.S. airspace model to support global mitigation strategies for collision avoidance functions.
- Investigate the potential for saturation of 1090 Mhz due to proliferation of ADS-B, Very Light Jets (VLJs) and Unmanned Aircraft Systems (UASs) in the coming years and decades. Identify impact/risk of systems or procedures that rely on this frequency band.
- Evaluate NextGen operations to evaluate compatibility of current TCAS (v7.0/7.1) and NextGen ACAS.
- Develop an integrated approach between separation assurance and collision avoidance, with special attention to the safety case.
- Study the effectiveness of collision avoidance logic that incorporates horizontal, vertical and speed resolution options.

The feasibility, costs, and safety complexities of developing improved collision avoidance will be weighed against the plans to implement new applications and other aspects of the changing airspace (i.e., compatibility with avionics equipage trends). In conjunction with this research, candidate sources to support improved surveillance (i.e., ADS-B) will be explored, along with the potential to supply the data elements required for the collision avoidance capabilities and the accuracy and integrity of that data.

Benefits: All aspects of the program are focused on safety issues related to this collision avoidance systems, its ability to resolve near-midair encounters, and pilot's ability to react correctly to issued TCAS instructions.

11. Low Cost Ground Surveillance ($5,000,000):

Description of Solution: This program is intended to address ground traffic surveillance shortfall that exists at small and medium airports in the NAS. Prior year efforts funded through the Runway Incursion Reduction Program (RIRP) will result in the procurement, installation and evaluation of candidate solutions for investment decision consideration. A capital program investment decision is expected in FY 2009. The requested funds provide for initiating acquisition and implementation activity in anticipation of that decision.

Benefits: Safety: The LCGS system is expected to increase controller situational awareness especially during low visibility conditions by providing a real-time display of airport surface traffic data. LCGS technology will also serve as the underlying element for cost-effective application of pilot alerting aids like RWSL and FAROS at small and medium airports. These added capabilities are expected to reduce the risk of ground traffic incidents, runway incursions, or accidents.

FAA Savings: N/A. LCGS is an aviation safety enhancement initiative.

12. Aeronautical Information Process Improvement ($1,000,000):

Description of Solution: This program proposes to adopt an agency-wide strategy for resolving problems with creating, updating and distributing aeronautical information. An AIM process improvement strategy should address the problems listed in Section 1.2. It is crucial that the solution strategy:

- Address productivity improvements while maintaining safety
- Provide the agility and inventiveness to address global AIM trends and customers needs
- Address supply chain complexities
- Accommodate differences in organizational missions

The solution will be based on:

- Modern information management principles including information stewardship, federated architectures, orchestration and common operating picture.
- Business process re-engineering to transform to a process-centric enterprise. This will ensure every step in the process adds value to the end user customers.
- Enterprise Architecture to ensure Aeronautical Information systems and processes support current and future ATM requirements and to facilitate analysis of duplicate operations and system functions
- A common access point to ensure consistency for operational ATC and other customers.
- Aeronautical information process improvement team comprised of stakeholder organizations that help develop and implement the process innovation strategy.

Benefits: The following benefits are expected to accrue as a result of the Aeronautical Information Process Improvement:

- Reduced costs for collecting, managing, charting and publishing aeronautical information
- Reduction in accidents where faulty aeronautical information is a contributing factor
- Reduction in costs to adapt aeronautical information for use in air traffic control systems
- Improved customer satisfaction
- Reduced rework for systems creating aeronautical information
- Reduced operation costs because of reduction in redundant systems
- Simplified transition into future environments, SWIM and NextGen

13. ATDP – In-Service Engineering ($600,000):

In-service engineering allows for immediate response to emerging technology solutions. Funding is requested for ongoing engineering support of all prototyping efforts.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$563,012.0 [1]
FY 2009 Appropriated	---	44,900.0
FY 2010 Request	---	41,800.0
FY 2011-2014	---	129,900.0
Total	Various	$779,612.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Runway Incursion Reduction Program and IOT&E	---	$10,000.0
2. System Capacity, Planning and Improvements	---	4,100.0
3. Operations Concept Validation	---	8,000.0
4. NAS Weather Requirements	---	1,000.0
5. Airspace Redesign	---	3,000.0
6. ATO Strategy and Evaluation	---	3,000.0
7. Dynamic Capital Planning	---	1,500.0
8. Wind Profiling and Weather Research Juneau	---	1,100.0
9. Wake Turbulence	---	1,000.0
10. Traffic Collision Avoidance System (TCAS)	---	2,500.0
11. Low Cost Ground Surveillance	---	5,000.0
12. Aeronautical Information Process Improvement	---	1,000.0
13. In-Service Engineering	---	600.0
Total	Various	$41,800.0

[1] The FY 2001 appropriation has been adjusted to reflect the rescission amount pursuant to P.L. 106-554. Includes reduction pursuant to P.L. 108-7, February 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A02	**NAS Improvement of System Support Laboratory**	**$1,000,000**	**1**	**F-14**

FAA Strategic Goal: Organizational Excellence – Ensure the success of the FAA's mission through stronger leadership, a better trained and safer workforce, enhanced cost-control measures, and improved decision-making based on reliable data. Objective 3 - Improve financial management while delivering quality customer service.

Description of Problem: The FAA's centralized set of laboratories located at the William J. Hughes Technical Center provide the infrastructure for research, development, testing, and field support to the FAA's Capital Investment Plan (CIP) programs. It is necessary to modify, upgrade, and reorganize the Laboratory infrastructure as CIP projects and their supporting systems are delivered, installed, and eventually removed. The Technical Center Lab infrastructure encompasses approximately 160,000 square feet in the main building plus numerous outlying buildings and remote sites.

Description of Solution: The Technical Center's System Support Laboratory provides the environment to implement, test, and integrate new systems into the National Airspace System (NAS). Once accepted, the systems become part of the test bed and are used to provide support to the operational field sites over the life-cycle of the operational systems. To maintain a viable test bed, it is periodically necessary to upgrade and enhance those portions of the facilities that support the systems and form an integral part of the test bed. Electronic switching systems are used to permit replication of the myriad-fielded system configurations and to permit multiple parallel testing configurations to run with a minimum of system components. The switching systems must be upgraded, enhanced, and expanded to meet the changing needs of the CIP system deliverables.

In FY 2008, $1,000,000 was appropriated for system support laboratory improvements, such as the Business Continuity Plan design and beginning of modifications, the mockup tower renovation, router and firewall, rack servers and tape silos, and power quality monitoring and usage system expansion. In FY 2009, $1,000,000 was appropriated for various improvements to the Laboratory systems in order to support CIP programs. For FY 2010, $1,000,000 is requested for various improvements to the Laboratory systems in order to support CIP programs.

Benefits: The program improves FAA's centralized state-of-the-art laboratory environment that supports the implementation, testing, and integration of new NAS systems prior to their delivery to the various FAA field sites. The single, centralized support laboratory helps FAA the avoiding cost of establishing and maintaining multiple laboratories for each project, program, Service Unit, and Line of Business.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$44,855.8 [1]
FY 2009 Appropriated	---	1,000.0
FY 2010 Request	---	1,000.0
FY 2011-2014	---	4,000.0
Total	1 [2]	$50,855.8

[1] Excludes $2,000,000 appropriated in FY 2000 under Technical Center Facilities. Includes $250,000 reduction of the FY 2002 funds pursuant to supplemental P.L. 107-206, January 23, 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003.

[2] All work/services to be performed at FAA William J. Hughes Technical Center.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Integration/Implementation of NAS Laboratory	1 [1]	$1,000.0

[1] All work/services to be performed at FAA William J. Hughes Technical Center.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A03	**William J. Hughes Technical Center Facilities**	**$12,000,000**	**1**	**F-14**

FAA Strategic Goals: Organizational Excellence – Ensure the success of the FAA's mission through stronger leadership, a better trained and safer workforce, enhanced cost-control measures, and improved decision-making based on reliable data. Objective 3 - Improve financial management while delivering quality customer service.

Description of Problem: The FAA's centralized set of laboratories located at the William J. Hughes Technical Center provide the infrastructure for research, development, testing, and field support to FAA's Capital Investment Plan (CIP) programs. These laboratories provide around the clock operations support to En Route, Terminal, and other Air Traffic Control (ATC) facilities throughout the nation. It is necessary to sustain these Laboratory systems in configurations and capabilities that match field sites that currently exist or are planned for the future. CIP programs and field sites depend on these laboratories to fulfill their mission.

Description of Solution: For FY 2010, $12,000,000 is requested to sustain FAA's laboratory test beds and will be used for hardware and software support, software licensing fees, and other costs associated with operating these multi-user facilities. These laboratories include the en route and terminal test beds; navigational, scan radar, and automated tracking sites; communications switching equipment; the aircraft fleet (flying laboratories); aircraft simulation systems such as the target generator, cockpit simulators, and the Human Factors Laboratory.

Benefits: The support is necessary for the successful development and implementation of various programs of the CIP. In addition, ATC field facilities support mission will continue throughout the transition from today's system to the full implementation of FAA's modernization efforts. These facilities provide in-house testing required to ensure new systems and modifications are thoroughly evaluated in an integrated environment to minimize problems prior to field deployment. A stable funding source obviates the need for each program office to establish and sustain the infrastructure needed to support their programs and fielded systems. This has been a proven method to sustain the Test Beds and to minimize FAA costs.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$168,354.5 [1]
FY 2009 Appropriated	---	12,000.0
FY 2010 Request	---	12,000.0
FY 2011-2014	---	48,000.0
Total	1 [2]	$240,354.5

[1] Includes $2,477,500 appropriated in FY 2000 for Technical Center Infrastructure Sustainment and $2,000,000 in FY 2000 for NAS Improvement of System Support Laboratory. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.
[2] All work and services to be performed at FAA William J. Hughes Technical Center.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Hardware Sustainment	---	$943.6
2. Software Licenses and Support	---	216.3
3. Sustainment, Engineering and Support Services	---	9,090.0
3. Parts, Supplies and Equipment	---	1,330.1
4. Pilot Training	---	420.0
Total	1	$12,000.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A04	**William J. Hughes Technical Center Infrastructure Sustainment**	**$5,500,000**	**1**	**F-16**

FAA Strategic Goals: Organizational Excellence – Ensure the success of the FAA's mission through stronger leadership, a better trained and safer workforce, enhanced cost-control measures, and improved decision-making based on reliable data. Objective 3 - Improve financial management while delivering quality customer service.

Description of Problem: The William J. Hughes Technical Center (WJHTC) owns and operates test and evaluation facilities, research and development facilities, administrative and storage facilities, and numerous project test sites. The Technical Center must keep the Central Utilities Plant (CUP), utility distribution systems, and the building infrastructure in operating order. The WJHTC must also comply with International Building Codes, the National Fire Codes (NFC), the Americans with Disabilities Act (ADA) and current energy policies.

The Center's Water Plant was constructed in the 1940's and is well beyond its estimated service life. A private engineering firm's 20 year master plan for 34 buildings identified significant deficiencies. An electrical investigation during a 2007 construction project revealed that certain high voltage electrical cables are in marginal condition. The roof on Building 300 is at the end of its useful life and has been a maintenance nightmare. The Center has a need to evaluate the feasibility of improving both its electrical security and also its bargaining position in the current energy market.

Description of Solution: For FY 2010, $5,500,000 is requested for the following activity tasks:

Water Plant Replacement: This project replaces a water plant that has significant structural problems and is over 60 years old, well beyond the estimated service life. The plant replacement will drastically improve water generation reliability, a critical feature since this plant provides potable water to all Center facilities. Finally, the replacement effort will reduce maintenance costs, as the repair of a small portion of the plant distribution piping in 2006 cost approximately $100,000.

Center Facility System Improvements: A master plan, prepared in FY 2008, recommended replacement of architectural, structural mechanical, electrical, plumbing and life safety systems and subsystems in 34 Center facilities. This project replaces systems and equipment beyond their useful lives, and upgrades all deficient systems and equipment before serious operation and maintenance problems occur. The improvements will increase energy efficiency at these facilities by as much as 20 percent.

Primary Electric Cable Replacement: This project replaces damaged, underground, high voltage electrical feeders serving Buildings 301, 303 and 305 that are approaching the end of their useful lives. This project improves the reliability of cooling to the Building 300 ATC Lab Area, which houses the NAS Test Bed, BCP and eventually NextGen. This is a good business case as it will pay for itself through the elimination of just one power loss due to cable failure.

Building 300 Roof Replacement: This project will replace a roof that is beyond its useful life of 15 years with a roofing system that will be more appropriate for the facility. The project will significantly reduce roofing maintenance costs since as many as 10 leaks have occurred after a single, heavy rainstorm and identifying the source of a leak can require the removal of approximately 10,000 square feet of roofing area.

Evaluation of a Combined Heating and Power Facility: This evaluation will systematically and quantitatively determine the economic feasibility of installing a combined heating and power facility on Center. Such a facility has the potential of improving both utility security and reliability. The facility would also reduce energy costs (dollars) by improving the Center's bargaining position when procuring electricity from third party suppliers.

Benefits: The modifications will ensure the continued reliable operation of the WJHTC by replacing aged mechanical, electrical, and life safety equipment and required utility and other support systems before serious problems occur. The work will also improve life cycle infrastructure planning; update certain facilities, facility support systems and utility distribution systems; reduce energy consumption on a per square foot basis; and enable the Center to support changing FAA programs and missions. The program incorporates best business practices and adopts industry standards such as ASHRAE, NEC, NEMA, ANSI and IEEE.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$41,834.4 [1]
FY 2009 Appropriated	---	5,400.0
FY 2010 Request	---	5,500.0
FY 2011-2014	---	23,200.0
Total	1	$75,934.4

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Water Plant (Building 33) Replacement (construction)	---	$2,500.0
2. Mechanical/electrical system improvements to 14 facilities	---	1,500.0
3. Underground Primary Electric Cable Replacement	---	800.0
4. Building 300 Roof Replacement (design/permits)	---	400.0
5. Evaluation of a Combined Heating and Power Facility	---	300.0
Total	1	$5,500.0

[1] Excludes $2,477,500 appropriated in FY 2000 under Technical Center Facilities. Includes $750,000 reduction of the FY 2002 funds pursuant to supplemental P.L. 107-206. January 23, 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A05	**NextGen Network Enabled Weather (NNEW)**	**$20,000,000**	**Various**	**G-4W**

FAA Strategic Goal: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: In today's National Airspace System (NAS), weather is responsible for 70 percent of delays over 15 minutes and contributes to 24 percent of accidents and 34% of fatalities. Up to 2/3 of weather delays are avoidable, based on a recent assessment completed by the FAA RE&D Advisory Committee. Despite a continuous flow of improvements available through aviation weather science and implementation solutions aimed at providing better weather information, the significant impact of weather on aviation remains. Weather is often the tipping point for delay and safety in NAS operations. As air traffic levels are expected to increase in the NextGen era.

Weather information is needed for air traffic management and flight operations decisions. These decisions range from the planning of individual flights, to the management of individual terminals and airspaces, to managing the capacity of the NAS. Collaboration among decision makers is required to resolve the constraints brought about by weather. Air Traffic Management (ATM), Flight Operations Center (FOC), and flight deck operational decision makers are unable to collaborate effectively in order to make the strategic and tactical decisions of the day. The current procedures for making these decisions are either labor intensive, and/or rely on multiple inputs in order to infer the required decision. The system is unable to support these decision makers due to gaps in today's weather dissemination system; incomplete, inaccurate, and inconsistent weather forecasts; and gaps and inaccuracies in weather observations used to depict current weather conditions and to support forecast generation.

Problems to be addressed in NextGen are:

- Weather information not accessible to all users and cannot be manipulated in accordance with user specific needs
- Clear, accurate, consistent, complete, and unambiguous aviation weather information not available
- Weather products lacking the spatial or temporal resolution required for decisions involving key weather phenomena that impact aviation
- Inability to automatically develop and display the impact of weather on current or future NAS capacity
- Weather data not well integrated into either manual procedures or automated decision support tools (DST)

These problems collectively represent shortcomings in the FAA's current aviation weather capabilities and are addressed in several weather RPDs including weather observation improvements, weather forecast improvements, NNEW, and R&D activities.

NextGen Weather Dissemination Problem:

Presently, a consolidated weather data dissemination architecture does not exist within the FAA. The development of stovepipe systems has severely limited universal access to weather data. Until NextGen there has not been a general requirement within the FAA for weather systems to potentially share the same information and interact directly with ATM systems. This lack of requirement has led to a portfolio of FAA weather systems that lack a standardized approach to disseminating and accessing weather information.

There are several problem areas to be addressed:

- Isolated data. In today's FAA, weather information produced by one FAA weather system is generally only available to users of that particular system. Information gathered by one system is not easily shared with other systems or their users.
- Overlapping and redundant data. The multitude of different weather systems can provide inconsistent information about the weather in the same single point (lat, long, alt) in the NAS at any particular time. This architecture of overlapping systems has resulted in conflicting weather information and the lack of shared situational awareness.
- Weather information is not well integrated into automated decision support tools.
- Software standards are not utilized. Developing different systems with incompatible software prevents sharing of weather information.
- Inefficient point-to-point communications. The lack of standardization and inability to share information has led to an inefficient use of telecommunications.

Description of Solution: The NextGen Implementation Plan is establishing a broad framework for the services, technologies, policies, procedures, and methods of operation that must be implemented by 2025 to achieve the plan's national goals. This vision establishes improved weather capabilities as a key element of the national strategy for supporting air transportation and enhanced operational decision making between now and 2025, including improved weather dissemination capabilities.

The NextGen Network Enabled Weather (NNEW) effort will develop the standards necessary to support universal user/system access to needed weather information. It will enable the seamless access to standard weather data sets by all NextGen users by establishing the 4-Dimensional (4-D) Weather Data Cube. The 4-D Weather Data Cube will be a shared, 4-dimensional (three spatial dimensions and time) virtual database consisting of extensive sets of weather information including data that will be designated to be the single authoritative source for weather information used in the NAS. It will provide consistent, tactical and strategic-level weather information that will be accessible by all NAS stakeholders. The databases that the 4-D Weather Data Cube will consist of will be distributed among multiple, physical locations and suppliers that are connected and accessible by communication networks supported by World Wide Web concepts and technology. NNEW is responsible for establishing the information management capabilities necessary for the operations of the network-enabled 4-D Weather Data Cube. There will be demonstration efforts to resolve key technical questions and reduce implementation risk of a network-enabled weather environment to the FAA and external system users. This will include assurance that NNEW is fully compatible and consistent with the evolved System-Wide Information Management (SWIM) infrastructure. This will also serve to define open standards and requirements necessary for overall NextGen weather dissemination compatibility.

In FY 2010, $20,000,000 is requested to develop Weather Product Data Format Standards v3 for IOC Baseline, develop Weather Specific Services Design Standards v3 for IOC Baseline, develop Risk Reduction Activities for candidate IOC publisher/subscriber systems, Demonstrate Interagency Network Enabled Weather Data Sharing and begin developing Exhibit 300 program information.

Benefits:

FAA Savings:

Reduced F&E and Ops costs by use of open standards for weather data access and format.
F&E cost avoidance: New NextGen subscribers will reuse weather data access software documentation and code.

- Ops costs avoidance: Greatly streamlines software update and change management strategies.
- Ops costs avoidance: Reduces communications lines required by weather data subscribers

User/AOC Reduced User Costs:

- Eliminates need for unique interfaces to support access to weather information
- Collaboration improved by having common access by all decision support tools

FAA Productivity:

- Improved productivity and reduced TFM workload and stress
- Collaboration improved between FAA and airlines by having common access to weather data base
- Allows efficient retrieval of weather data needed directly by decision support tools

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$7,000.0
FY 2009 Appropriated	---	20,000.0
FY 2010 Request	---	20,000.0
FY 2011-2014	---	169,800.0 [1]
Total	Various	$216,800.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Network Enabled Weather	---	$20,000.0

[1] Future requirements under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A06	**Data Communications in support of Next Generation Air Transportation System (NextGen)**	**$51,700,000**	**Various**	**G-1C**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: Air traffic management in the National Airspace System (NAS) is dependent upon rapid reliable communications between air traffic controllers and pilots. The present voice-based air/ground infrastructure will not support traffic growth beyond 2020. Since controllers currently communicate with pilots using voice, revisions to aircraft flight paths are made through multiple instructions or lengthy verbal exchange. This process is time and workload intensive, limits efficient use of aircraft and airspace, and is prone to verbal communication errors. Increased controller workload and flight delays are the result, which impact the capacity of the NAS. Many of the transformational improvements associated with the Next Generation Air Transportation System (NextGen), including trajectory-based flight and net-centric operations, cannot be achieved using the present voice system.

Description of Solution: For FY 2010, $51,700,000 is requested for Final Investment Decision (FID) management and planning technical support; ERAM system engineering and specifications development; Tower Data Link Services (TDLS) automation specifications development; screening information request (SIR) development data communications network services; systems engineering; standards development; avionics validation, prototype and demonstration support; integration, test planning and laboratory development; operational capability and integration support, and human factors for NextGen Concept of Operations (CONOPS). Data Communications will bridge the gap between current voice-only air traffic control, and the data-intensive Next Generation Air Transportation System (NextGen). To ensure the NAS has the capacity to grow, Data Communications will implement services that maximize controller productivity, reduce operational errors associated with voice communications, and enable new air traffic services and reduce delays. Data Communications is comprised of automation enhancements for air traffic control message generation and exchange (hardware and software), and the communications data link between ground and airborne users.

Automation enhancements and link acquisition will begin in 2012, with benefits from Data Communications beginning with initial operations in 2016. The Data Communications plan calls for multi-stage, incremental development and deployment, so the program anticipates planning activities and costs as subsequent program segments proceed through the investment analysis process. Initially, data communications will provide an additional means for two-way exchange between controllers and flight crews for air traffic control clearances, instructions, advisories, flight crew requests and reports. Eventually, the majority of communications will be handled by data communications for appropriately equipped users. Automated data communications will support the NextGen vision by enabling air traffic control to issue an entire route of flight with a single data transmission directly to an aircraft's flight management system. This Data Communications program will progressively move the National Airspace System (NAS) toward NextGen by building incremental capabilities that reduce unit costs while enhancing capacity and safety.

Since Data Communications is in the planning phase, cost, schedule, and performance data reflect the current program plan, which will continue to be refined as the planning is completed.

Benefits: Data communications are at the heart of NextGen advanced airspace management concepts. The operations and services enabled by data communications will allow more efficient, strategic management of the airspace, enabling the Agency to meet the growing demand for air travel, all while improving operational and life-cycle costs for both airspace managers and users.

Current analog voice communications contribute to operational errors due to miscommunications, stolen clearances and delayed messages due to frequency congestion. In FY 2004 and FY 2005, approximately 20 percent of en route operational errors were voice communication related. Of those, 30 percent of the high severity operational errors were deemed to be communications-related. With substantial aircraft equipage, data communications will significantly reduce communications-related operational errors and improve the safety of air travel.

Data communications will enable air traffic controller productivity improvements, and will permit capacity growth without requisite cost growth associated with equipment, maintenance, and labor. As a result, unit costs (the resources necessary to provide air traffic management service per aircraft operation) will decrease. Data communications will enable these benefits by automating repetitive tasks, replacing voice communications with more accurate, less workload-intensive data communications, and enabling ground systems to use real-time aircraft data to improve traffic management efficiency. Several studies suggest that with 70 percent of aircraft data-link equipped, exchanging routine controller-pilot messages and clearances via data can enable controllers to safely handle approximately 30 percent more traffic. This increase in traffic handling ability has a direct correlation to reduced delays and increased capacity - recent benefits analysis suggests airline operations will benefit from reduced flight times, improved on time performance and the opportunity to expand flight schedules. Data communications enabled NextGen services, including 4D trajectories and conformance management, will further improve capacity and efficiency by shifting air traffic operations from short-term, minute-by-minute tactical control, to more predictable and planned strategic traffic management.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$7,400.0
FY 2009 Appropriated	---	28,800.0
FY 2010 Request	---	51,700.0
FY 2011-2014	---	1,451,600.0 [1]
Total	Various	$1,539,500.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. FID Management and Planning Technical Support	---	$7,800.0
2. ERAM System Engineering and Specifications Development	---	10,700.0
3. TDLS Automation Specifications Development	---	4,950.0
4. Sir Development Data Comm Network Services	---	2,500.0
5. Systems Engineering	---	3,750.0
6. Standards Development	---	2,500.0
7. Avionics Validation, Prototype and Demo Support	---	12,000.0
8. Integration, Test Planning and Lab Development	---	2,500.0
9. Operational Capability and Integration Support	---	2,300.0
10. Human Factors for NextGen CONOPS	---	2,7000
Total	Various	$51,700.0

[1] Future requirements under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A07	**NextGen Demonstrations and Infrastructure Development**	**$33,773,730**	**Various**	**G-8M, M-49**

FAA Strategic Goal: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The Federal Aviation Administration (FAA) Next Generation Air Transportation System (NextGen) demonstration and infrastructure development program was established to assist in transforming the National Airspace System (NAS) to meet the vision of the future NAS as defined by the Joint Planning and Development Office (JPDO). Led by the Advanced Technology Development and Prototyping (ATD&P) Group, this program is designated to integrate demonstration projects and programs, provide validation of mature solutions, and demonstrate implementation alternatives for the NAS, as well as sustain the ATD&P NextGen demonstration sites. This program provides agility and flexibility in demonstrating alternative technologies, and concepts, while supporting procedure and standards development, as well as providing for the integration of near-term emerging technologies, procedures and / or customers' initiatives with on-going demonstrations. The demonstration program leverages the individual project demonstrations and supports the integration of these individual projects into multiple-domains designed to capture the synergies that are needed to provide timely NAS transformation. The ATD&P NextGen demonstration and infrastructure development program also directly supports emerging technology solutions and airspace customer solutions that will allow the FAA to define how future air traffic and airport operations will be managed, how the environment will be protected and enhanced, and how improvement to efficiency, safety and capacity can be achieved near-term. The ATD&P demonstration and development program directly supports how the NAS will evolve and operate in the 2015 timeframe and beyond, and how the long-term objectives of validating 4-Dimension Trajectory Based Operations (4-D TBO) for all NAS domains will be accomplished, along with follow-on performance-based air traffic management (PATM).

The United Nations IPCC allocates only 2–3 percent of today's global carbon dioxide (CO_2) emissions to aviation. While its overall contribution is relatively small, aviation is considered one of the few rapidly-growing contributors. Efforts to minimize the industry's environmental impacts will be complicated by anticipated increases in both domestic and international air transportation operations.

Environmental impacts resulting from aircraft noise and emissions could emerge as a significant constraint on aviation industry growth. Cooperation to address the industry's environmental challenges could both maximize aviation's collective environmental improvements, and mitigate the potential adverse effects that environmental impacts and society's concerns may impose on industry growth.

Reduced energy consumption and engine emissions are core aviation business principles. Since 1970, the number of airline passengers transported in the United States has tripled while community exposure to significant aircraft noise has decreased almost 95 percent. Aircraft today are 60 percent more fuel efficient than the fleet operating 40 years ago. Progressively stringent aircraft noise and emission standards have been established over the past three decades. These include a phase out of Stage 1 and Stage 2 airliners. Airports have voluntarily implemented noise abatement and emission control programs, supported by airport improvement funding and passenger facilitation charges. As of 2007, the U.S. airline industry is moving 12 percent more passengers and 22 percent more freight than it did in 2000, with 5 percent less fuel burned and commensurate emissions reductions.

With increasing demand the need grows to achieve peak throughput performance at the busiest airports and in the busiest arrival/departure airspace. Capability improvement via new procedures to improve airport surface movements, reduce route spacing and separation requirements, and improve overall tactical flow management into and out of busy metropolitan airspace is needed to maximize traffic flow and airport usage. Essentially the problem is getting the right aircraft to the right runway in the right order and time to minimize its individual impact on the system and maximize the use of these airports. Thus operations are conducted to achieve maximum throughput while facilitating efficient arrival and departure. Inefficiencies in any aspect of the operation reduces the total use of the capacity and, because of high demand, causes excessive compounding of delay.

Operation of Unmanned Aircraft Systems (UAS) in the NAS is strictly controlled. Operators of UAS must apply to FAA for authorization to engage in flight activities and operations must be specifically authorized. Applications are reviewed by elements of the Air Traffic Operations organization and the Aviation Safety Unmanned Aircraft Program Office to ensure that approval to fly unmanned aircraft, regardless of size, will not compromise the high level of safety for other aviation and the public and property on the ground. Operators must apply for a Certification of Authorization or Waiver (COA) to operate an unmanned aircraft. UAS flights are not permitted over populated areas and no hazardous material may be carried or objects dropped outside of Restricted Area Airspace. Other restrictions may be applied that hamper the accomplishment of the UAS operator's mission. The COA process has been implemented until concerns over the safety of UAS operations can be allayed. The demonstration project is part of the process to prove the viability of UAS to operate safely in the NAS without undue risk. The ultimate goal is that UAS have unfettered access to the NAS. Unfettered access to the NAS for DoD UAS is a growing imperative. Future civilian demand is anticipated.

The following shortfalls in the existing NAS need to be considered and resolved:

- The integration of individual-domain (intra-domain) which would allow for end-to-end (or multi-domain) demonstration and testing
- The immediate (near-term) integration of new emerging technologies, or applications into existing or planned demonstrations
- NAS near-term demonstration initiatives supporting government / industry partnership demonstrations
- The sustainment of the individual or end-to-end (multi-domain) demonstration sites
- Costs for new towers for medium-sized airports have approached $30 million per airport. With several hundred towers needing repair or expansion, the total annual operating costs are, or will exceed, budget expectations by a substantial margin. Runway safety enhancements need to keep pace with traffic growth and demand

<u>Description of Solution:</u> NextGen demonstrations will be conducted in close cooperation with both internal FAA and JPDO. Demonstration, developmental, and validation activities, transforming technology resources (demonstration sites and end-to-end demonstration activities) will include the following for FY 2010:

- Environmental: International Air Traffic Interoperability:
  - Continued demonstrations of trajectory-based management in the arrival domain to collect benefits data for a reduction in the carbon footprint of aviation operations.
  - Flight demonstrations across the Atlantic to provide requirements and standards for future automation upgrades.
  - Surface management improvement demonstrations to reduce taxi times for less fuel consumption.

- High Density Capacity: High Density Airport (HDA) Capacity and Efficiency Improvement:
  - A second site demonstration of the 3D Path Arrival Management tool will be conducted to collect additional data to enhance efficiency, provide greater capacity, and reduce fuel consumption.

- Unmanned Aircraft Systems (UAS) 4D:
  - Flight trials will be conducted in Florida to facilitate the need for integration of DoD and other governmental agency UAS operations into the NAS. Demonstrations provide a means to validate and prove concepts and establish confidence in the safety case for UAS. Demonstrations support ongoing work of RTCA Special Committee 203 (SC-203) which is developing performance requirements for operation of UAS in the NAS. This work will lay the foundation for the Minimum Aviation System Performance Standards (MASPS) for UAS and other regulatory criteria leading to the safe operations of UAS in the Next Generation Air Transportation System (NextGen).

- Staffed NextGen Towers:
  - Air Traffic System Concept Development will conduct cognitive walkthroughs, rapid prototyping, and human-in-the-loop simulations to refine the Staffed NextGen Tower (SNT) concept and requirements. We will conduct a field demonstration for Phase 1 of the SNT concept in FY 2010.

        - As part of Phase I, both lab and field demonstrations will be conducted to further examine SNT alternatives and assess their feasibility. Information collected from the cognitive walkthroughs and rapid prototyping activities will facilitate the development of human-in-the-loop simulations and preliminary requirements. The simulations will allow for identification and further refinement of the preliminary requirements and comparison of the SNT alternatives in a controlled laboratory environment. The simulations will also provide for early resolution of potential operational issues and provide information that will be used in the design of the field demonstration.
    - A field demonstration will be conducted at a site to be determined (TBD) using an SNT system in FY 2010. The field demonstration will serve as a proof of concept and as a comprehensive site for testing of the technology in an operational environment. Operational, technical, and human factors data will be collected and user feedback obtained on their assessment of the operational feasibility, suitability, and acceptability of the concept.

- Demonstration Site Development / Sustainment:
    - The demonstration sites being considered include Orlando, FL, Dallas, TX, and the FAA's WJHTC. Demonstrations will continue to be conducted for faster and more reliable testing and results using multiple systems -- the beginning of integration for NextGen. We will emphasize the integration of individual-domain (intra-domain) which would allow for end-to-end (or multi-domain) demonstration and testing. These sites will provide immediate (near-term) integration of new emerging technologies, or applications into existing or planned demonstrations, while NAS customers see these sites as a visible, near-term step toward initiatives that support government / industry partnerships.

- Joint Planning Development Office (JPDO)
    - The JPDO will enhance and maintain the multi-agency Joint Planning Environment that provides a transparent web-based view of Enterprise Architecture and Integrated Work Plan information.

Benefits: The NextGen Technology Demonstration program is a development effort to support the transformation of the NAS to 4-D trajectory management and a performance-based system. The program provided integration and demonstration of alternate technologies and concepts, while supporting procedures and standards development, integration of near-term emerging technologies and airspace customers' initiatives with on-going scheduled demonstrations. This program provides a vehicle to test concepts and leverage individual transformational program and project technology to create multi-domain cohesive demonstrations to capture the synergies needed to transform the NAS in an expedited manner. The evaluation of technology and the collaboration between public/private industry partners, ANSPs, customers, and owners will continue into perpetuity.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$50,000.0
FY 2009 Appropriated	---	28,000.0
FY 2010 Request	---	33,773.7
FY 2011-2014	---	120,000.0 [1]
Total	Various	$231,773.7

[1] Future requirements under review.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. International Air Traffic Interoperability	---	$7,500.0
2. High Density Airport (HDA) Capacity and Efficiency Improvement Project	---	4,000.0
3. Unmanned Aircraft Systems (UAS) 4D Trajectory Based Demonstration	---	4,773.7
4. Staffed NextGen Towers	---	5,700.0
5. Demonstration Site Development and Sustainment	---	8,000.0
6. JPDO Program Management	---	3,800.0
Total	Various	$33,773.7

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A08	**Next Generation Air Transportation System (NextGen) – System Development**	**$66,100,000**	**Various**	**G-1M, G-6M, G-7M, M-25**

FAA Strategic Goals: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: In 2003 under Public Law 108-176, Congress created a multi-agency Joint Planning and Development Office (JPDO) to manage work related to the Next Generation Air Transportation System (NextGen) to meet air traffic demand by 2025. The JPDO's 2004 Integrated Plan identified three key performance targets to achieve the desired capability by 2025. These are (1) satisfy future growth in demand up to three times current levels; (2) reduce domestic curb-to-curb transit time by 30 percent; and (3) minimize the impact of weather and other disruptions to achieve 95 percent on time performance. Achieving these targets by 2025 is a challenge. In addition, an increase in demand of three times the current levels could cause a similar increase in the number of accidents, aircraft noise and emissions, and air traffic controller workload. This line item provides the research and development required to resolve these potential problems.

The solution involves four areas of research and development – safety, capacity, human factors, and environment. The safety research includes expanding information sharing and data analysis to identify and mitigate risks before they lead to accidents. The capacity research develops new air traffic management systems to support NextGen measures and NextGen concepts to determine if they achieve the targets for 2025; and develops flexible airspace categories to increase throughput. The human factors research provides higher efficiency levels in air traffic control and identifies the new role for controllers as more responsibility shifts to the flight crew. The environmental research explores new procedures, and adapts new technologies and fuels into the National Airspace System (NAS) to reduce emissions, fuel burn, and noise; and includes demonstrations, methods to adapt the current infrastructure, and estimates of costs and benefits.

1. Human Factors (Controller Efficiency and Air Ground Integration) ($10,000,000):

Description of Solution: Automation and technology must work in concert with the humans in the system to meet the targeted efficiency levels. This program targets the integration and harmonization of the various NextGen concepts into a workable solution that intelligently adds the many new capabilities, decision support tools and automation to the diverse NextGen actors' workstations to achieve the desired performance outcome. Human factors aspects of existing air traffic control systems are a limiting factor for traffic loads. Projected traffic loads will exceed the capability of our current mode of air traffic control when traffic levels exceed approximately 130 percent of 2004 levels (baseline). Achieving the capacity targets of NextGen and achieving self-separation between aircraft by the flight crew requires significant changes in the roles and responsibilities between pilots and controllers and between humans and automation. Integration of air and ground capabilities poses challenges for the air traffic service provider and the flight crew. A core human factors issue is to ensure that safety is maintained. Information on intent as well as positive information on delegation of authority must be clear and unambiguous; and analyses of new types of human error modes are required to manage safety risk in the changing environment.

For FY 2010, the program will refine the Human System Integration (HIS) Roadmap, continue development of the common air traffic workstation, and define requirements for integrated en route and terminal situation displays and procedures. The program will develop collaborative ATM information and communication flows; refine air traffic selection processes using the results of the updated Strategic Job Task Analysis and begin development of NextGen training needs using the results of the Strategic Training Needs Analysis. The program will have an additional focus on collaboration between the various actors in the NAS (controllers, pilots, dispatchers, traffic flow managers, maintainers, etc.). This portion of the program will result in preliminary human error and safety analysis concerning changes in air traffic service provider and flight crew roles and responsibilities to manage safety of the NAS; define preliminary roles and responsibilities for actors in the NAS to achieve required performance; develop a simulation and demonstration roadmap laying out incremental objectives, simulation requirements, assumptions, and risks for assessing integration of ATSP tools, including for weather and wake separation; and assess improved weather displays that provide accurate and timely graphical weather information in the en route and terminal domain.

Benefits: The human component is arguably the most important and least addressed part of NextGen. In the system engineering context the NextGen system is incomplete and is at risk of inadequate performance. This program will measure the human performance benefits of NextGen as each of the components converge at the workstation – which is the point of delivery of air traffic services. This program will also address the air ground integration issues that stem from the interactions between the actors in the NextGen system. Unless benefits are measured with the human in the loop the benefits are not based on the total system.

Quantitative benefits data will be developed during the course of human-in-the-loop simulations. Each simulation will establish baseline performance and compare to performance under the new configuration. Human performance is measured in terms of number of macro elements such as aircraft being managed, airport or sector throughput, controller workload, and situation awareness. Other performance measures relate to task performance and micro measures such as number of keystrokes or time to visually scan a display to extract an element of information. Qualitative benefits data will be developed to address the acceptability of technology and procedures. Efficiency measures will likely be qualitative.

This program will assure that the workstations, decision support tools and automation used by air traffic personnel support the delivery of operational improvements. Without this program the scores of decision support tools and automation will converge on the controller and will suffer from lack of use, misuse, and abuse. The relationship between the actors in the NextGen NAS must be understood so that roles and responsibilities are in alignment with authority and policy and can be fully exercised.

2. Environment and Energy (Noise and Emission Reduction, Validation, and Modeling) ($7,000,000):

Description of Solution: The environmental research provides new and advanced aircraft and engine technologies, alternative jet fuels and operational procedures to reduce fuel burn, and emissions and noise impacts towards achieving NextGen environmental goals. A critical component of this research includes explorations, simple demonstrations as well as methods to integrate these environmental impact mitigation and energy efficiency options with the NextGen infrastructure in a costs-beneficial manner. It will also provide ways to adapt the NAS infrastructure to fully exploit the benefits of these environmental mitigation and energy efficiency options. This research program will also support development and implementation of Environmental Management System (EMS) which will manage NextGen related environmental impacts both at the organizational and enterprise levels.

Environment and Energy – Environmental Management System. Robust aviation growth will cause commensurate increases in fuel burn, and noise, and emissions impacts unless effective and cost-beneficial mitigation measures are implemented. The NextGen environmental goal is to achieve environmental protection that allows sustained aviation growth. Knowledge of human health and welfare impacts of aviation noise and emissions and their related health and welfare impacts metrics to enable appropriate means are critical to mitigate these environmental effects. These numerous highly complex environment and energy issues are interrelated, dynamic, and evolving. This complexity and change requires a framework that adapts to feedback and system changes to continually optimize mitigation approaches by well developed and demonstrated environmental impacts metrics. The strategic EMS will move the air transportation system toward the achievement of long-term goals through the establishment of management system elements at an enterprise and organizational level. It will support improved data and data-flow to enable better decision-making, which in turn, will enable technology, operational procedures, and policy to be refined, applied and adapted to cost effectively meet the needs of real operating conditions.

Environment and Energy – Advanced Noise and Emission Reduction. Robust aviation growth will cause commensurate increases in fuel burn, and noise, and emissions impacts unless effective and cost-beneficial mitigation measures are implemented. The potential for environmental damage could restrict capacity growth and prevent full realization of NextGen. Effective and proven capabilities as well as NAS-wide implementation of advance technologies, alternative jet fuels and improved operational procedures are the key to reduce significant environmental impacts while improving the energy efficiency of the system. This program element provides the interface between NextGen Environment and Energy Research and Development program designed to develop fuel burn, noise and emissions reduction options and the EMS which will manage the NextGen environmental impacts. This program also provides the interface between demonstration of new operational procedures in the NAS and exploration and early demonstration of procedures specifically targeted at environmental benefits.

Benefits: Manage environmental impacts of NextGen through Environmental Management System based on development and demonstration of solutions to mitigate noise and emissions and increase fuel burn efficiency Each research element in this line item has a target for the year 2016 that involves a demonstration. The demonstrations will prove concepts and show that it is possible to meet the target operationally by the year 2025.

Environment and Energy – Environmental Management System. By 2016, this program element will provide system knowledge and processes to implement and manage NextGen system alternatives in the cost-beneficial manner to achieve environmental protection that allows sustained aviation growth. This program element will combine progress on environmental improvements relative to advance technologies, alternative jet fuels and improved operational procedures developed under related programs into a comprehensive Environmental Management System approach. Progress will be measured by demonstrating no environmental constraints at 166 percent capacity by 2011; at 230 percent capacity by 2013; and finally at 300 percent capacity by 2016. Research and development supports operational implementation by 2025.

Environment and Energy – Advanced Noise and Emission Reduction. By 2016, this program element will demonstrate that aviation noise and emissions can be significantly reduced in absolute terms in a cost-beneficial way and proven ways of managing uncertainties in noise, health and climate impacts to levels that enable more informed action. Progress will be measured by demonstrating (under the following program element) no environmental constraints at 166 percent capacity by 2011; no environmental constraints at 230 percent capacity by 2013; and finally no environmental constraints at 300 percent capacity by 2016. Research and development supports operational implementation by 2025.

3. New Air Traffic Management (ATM) Requirements ($13,200,000):

Description of Solution: For FY 2010, the FAA must continue developing the capabilities needed to make required capabilities supportive of NextGen solution sets. These capabilities are highly dependent on technologies that accurately predict and monitor the location, intent of aircraft and provide this information to other pilots, controllers, and other stakeholders. Some of the aspects of the NextGen Concept of Operations depend upon the aircraft as a participant in efficient, safe air traffic management both in-flight and on the airport surface. These capabilities also rely on procedures that keep traffic flowing smoothly in all weather and visibility conditions both in-flight and on the airport surface. The NextGen New ATM research initiative will result in enhanced methods of determining safe separation while optimizing capacity, for all flight regimes and all aircraft. The new ATM requirements program will identify and develop the operational requirements for the following programs:

Traffic Collision Avoidance System (TCAS)

- Analysis, requirements, pseudo-code-supports provide effective collision risk safety net in an environment of closely spaced parallel RNP route from top-of-descent to the runway

L-Band Communications Standard

- Complete evaluation in relevant environments through trials and test bed development
- Propose the appropriate L-Band solution for input to a global aeronautical standardization activity

C-Band Standard

- Goal IEEE 802.16e C-Band standard best suited for airport surface wireless mobile communications
- Conduct evaluation of an aviation specific standard to support wireless "mobile" communications in relevant airport surface environments
- Develop a channelization methodology for allocation of safety and regularity of flight services in the band to accommodate a range of airport classes, configurations and operational requirements.

Software Standard for Air/Ground Integration

- Continue analysis of approaches/methodologies for software assurance of complex air-ground systems.

- Develop a coordinated airborne and ground software assurance standard to support Air-Ground operational integrity.

Common Trajectory Requirements and Implementation Strategy

- Identify Trajectory Differences
- Evaluate Need and Fidelity
- Propose Standard for Exchange
- Analyze System changes and Allocations

Mid-term Advances in Tactical Flow

- Integration of EDA advances into ATM (allocation to ERAM & TMA)

Integration of Weather into DSTs (mid-term)

- Weather Information Requirements
- Individual trajectory analysis
- Correlation of forecast impact
- Wake into DST's

RNAV/RNP via Data Communications

- Delivery across data communications-requirements
- "On the fly" development, evaluation and delivery

Airborne SWIM

- Identify information distribution requirements for non-command and control information
- Evaluate alternatives
- Propose standard (if required)

Benefits: This program element conducts research to develop systems that support the capacity enhancements for seven solution sets of NextGen. By 2015, the research will demonstrate that the planned system can handle growth in demand up to three times current levels; demonstrate that gate-to-gate transit time can be reduced by 30 percent; and demonstrate that the system will allow achievement of a 95 percent on-time arrival rate. Progress on the research will be measured under the following program element. Research supports operational implementation by 2025.

Benefits include:

- International standards and validated technologies for air-ground data communications in L-band for continental flight domains, air-ground and ground-ground data communications in C-band for airport surface operations, and air-ground data communications in SatCom bands for oceanic, polar and remote operations.
- Networking layers standards for international interoperability of data communications across the physical and datalink standards proposed for use in L-band, C-band and SatCom bands.

4. Operations Concept Validation (Validation Modeling) ($10,000,000):

Description of Solution: The Operations Concept Validation Program addresses the FAA's goal for capacity and the DOT Reduced Congestion Strategic Objective to "Advance accessible, efficient, inter-modal transportation for the movement of people and goods." It also supports the FAA's National Aviation Research Plan goal for a "Fast, Flexible and Efficient" system that safely and quickly moves anyone and anything, anywhere, anytime on schedules that meet customer needs. The program supports these goals by developing and validating future end-to-end (flight planning through arrival) operational concepts with special emphasis on researching changes in roles and responsibilities between the FAA and airspace users (e.g., pilots and airlines), as well as the role of the human versus systems, that will increase capacity and improve efficiency and throughput. It fits within the Air Traffic Organization's pathway 4, "Ensure Viable Future" to assure a sustainable and affordable Air Transportation System for the future by developing future operational concepts that will decrease workload and increase reliance on automation for routine tasking, and new procedures both on the ground and in the air to increase efficiency of the NAS. Furthermore, this program works toward developing operational methods that will meet the NextGen goal of expanding capacity by satisfying future growth in demand (up to three times capacity) as well as reducing transit time (reduce gate-to-gate transit times by 30 percent and increasing on-time arrival rate to 95 percent).

As proposed system alternatives for NextGen develop, there must be an understanding of the economic and operational impact of the proposed solutions. This requires a thorough understanding of how the aerospace system operates, the impact of change on system performance and risk, and how the system impacts the nation. There must be methods, metrics, and models that demonstrate whether or not the proposed solution contributes to increased capacity, reduced transit time, or increased on time arrivals; and if so, how much the solution contributes. The demonstration must address the combined solution as a system in terms of its progress toward and ultimate achievement of the NextGen targets. This program will conduct research to identify and validate changes to current air traffic management operations that will foster increased system capacity, efficiency, and throughput. Concept validation activities will ensure the future concepts are feasible, will realize expected benefits and identify the human factors implications of the concepts. Validated operational concepts will identify technical and operational requirements, such as airspace, procedures, and Communications, Navigation, Surveillance, and Automation requirements, needed to realize the capacity gains.

For FY 2010 research will focus on end-to-end concept development and validation activities for operational changes for NextGen solution sets. Specific concept elements will be validated through simulation and modeling.

Benefits: By 2016, this program element will provide system knowledge to understand economic (including implementation) and operational impact (with respect to capacity improvements) of NextGen system alternatives. It will measure the proposed NextGen system alternatives to determine whether or not the system meets the capacity targets of NextGen. It will develop methods, metrics, and models to measure capacity improvements. Progress will be measured by demonstrating capacity increases to 166 percent current levels by 2011; 230 percent by 2013; and 300 percent by 2016.

5. Systems Safety Management Transformation ($16,300,000):

Description of Problem: In 2003 under Public Law 108-176, Congress created a multi-agency Joint Planning and Development Office (JPDO) to manage work related to the Next Generation Air Transportation System (NextGen) to meet air traffic demand. This increase in capacity must be accomplished while continuing to (1) maintain aviation's record as the safest mode of transportation, (2) improve the level of safety of the U.S. air transportation system, and (3) increase the safety of worldwide air transportation Achieving these targets by 2025 is a challenge. This line item provides the research and development required to improve safety as air traffic grows. This will be accomplished through an integrated safety management approach that will provide a proactive means for building safety into the air transportation system we are developing and safely managing it through the transition. Key to this transformation will be the development of cutting-edge operational data analysis capabilities for the identification of safety issues. This research will promote expansion of the U.S. capability to meet national and international safety goals and objectives with less oversight of individual carriers.

Description of Solution: Achieving NextGen will require a full-scale transformation of the NAS, because our current system simply is not scalable to handle the required changes. A fully successful NextGen system is dependent on careful examination and integration of what technologies and responsibilities should reside with the aircraft and what technologies and responsibilities should reside on the ground. At the same time, safety will remain the top priority of FAA. Transforming the system will require a thorough understanding of the operational impact (with respect to safety) of system alternatives. While pursuing three times current levels of capacity, FAA will continue to pursue reduced fatality rates.

For FY 2010, activities to support requirements for: data analysis capabilities to predict, identify, and mitigate safety risks before they become accidents; safety guidelines to help stakeholders develop their own safety management systems; and modeling to help measure progress toward achieving FAA goals.

Benefits: Research and development identifies constraints and barriers, and separates solutions that are effective from those that are not. In FY 2014, the capabilities to perform a National Level System Safety Assessment that will proactively identify emerging risk across the NextGen will be demonstrated. The demonstration will prove the capabilities are on track to meet operational targets by the year 2025. The benefits are: (1) capacity increased to three times current levels; (2) curb-to-curb transit time reduced by 30 percent; (3) on time performance increased to 95 percent; (4) noise and emissions reduced in a cost effective way to allow three times capacity; (5) air traffic controller efficiency increased to three times current levels; (6) aerospace-related fatality rate reduced commensurate with capacity increase; and (7) understanding of economic and operational impact of system alternatives. Benefits for the items in the FY 2010 request are as follows:

This program contributes to reducing the fatality rate commensurate with increases in capacity under NextGen. By 2015, this program element will provide system knowledge to understand economic (including implementation) and operational impact (with respect to safety) of NextGen system alternatives. The research outcomes include an infrastructure that enables the free sharing of de-identified, aggregate safety information that is derived from various government and industry sources in a protected, aggregated manner; and demonstration of a National Level System Safety Assessment working prototype that will proactively identify emerging risk across the NextGen. Research supports operational implementation by 2025.

6. Wake Turbulence (Re-categorization) ($2,000,000):

Description of Solution: For FY 2010, $2,000,000 is requested to continue the development of a new safe, but more capacity efficient set of wake separation standards. The last full review of wake separation standards used by air traffic control occurred nearly 20 years ago in the early 1990's. Since then, air carrier operations and fleet mix have changed dramatically, airport runway complexes have changed and new aircraft designs (A-380, very light jets, unmanned aircraft systems) have been introduced into the National Airspace System (NAS). The 20 year old wake separation standards still provide safe separation of aircraft from each other's wakes but no longer provide the most capacity efficient spacing and sequencing of aircraft in approach and en-route operations. This loss of efficient spacing is causing an unnecessary gap between demand and the capacity the NAS can provide.

Recently work was done with the air traffic control wake separation standards to accommodate the A380 class of aircraft and work continues to address introduction of other large aircraft. This project will build on that joint work and accomplish a more general review to include regional jets, unmanned aircraft systems, microjets, etc. The work is phased, starting with optimizing the present "1990's" air traffic control wake separation standards to reflect the change in fleet mix that has occurred over the last 20 years. By 2010, the project will have a set of recommendations for international review that focuses on changes to the present static standards. To accomplish this, the project will develop enhanced analysis tools to link observed wake behavior to standards, determine safety risk associated with potential new standards relative to existing standards; simulate and validate new separation standards; integrate the work being accomplished by EUROCONTROL; and conduct analyses to link wake transport and demise characteristics to aircraft flight and surrounding weather parameters.

The next phase of this project will develop by 2014, sets of air traffic control wake separation standards whose application would depend on flight conditions and aircraft performance; resulting in being able to get more aircraft into and out of airports and in the same volume of airspace. By 2020, the final phase of the project will have developed the aircraft and ground based capabilities required to achieve the NextGen concept of safe, efficient dynamic pair-wise separation of aircraft. The dynamic pair-wise separation capability will allow the densest feasible safe packing of aircraft in a given airspace.

Benefits: This project will contribute to the NextGen target of handling growth in air traffic demand of up to three times the current levels. The project will focus on re-categorization of wake separation standards in three steps. By 2010, it will provide static safe capacity efficient changes to the present air traffic control wake separation standards, using the six current aircraft weight categories adjusted to account for fleet mix changes. These changes are projected to allow some airports to increase their arrival and departure rates by several aircraft per hour. By 2014, the project will develop an alternate set of wake separations standards and procedures for use under specific conditions to safely place more aircraft in the same volume of airspace. By 2020, the project's outcomes will support dynamic, pair-wise wake separation of aircraft - which will provide the most capacity efficient aircraft spacing that is theoretically possible. If the development of a means to dynamically pair-wise separate aircraft proves successful, operational implementation of the dynamic capability is projected to be in the 2025 time frame.

7. NextGen Operational Assessments ($7,500,000):

Description of Solution: The transition to NextGen requires the conduct of operational assessments to ensure that safety, environmental, and system performance considerations are addressed throughout the integration and implementation of NextGen. Such assessments are particularly important as the NextGen program begins to evaluate current airspace design and as new procedures are developed and implemented within the NAS. For FY 2010, funding is requested to conduct system safety assessments, environmental-specific assessment and environmental model advancements, system performance management, and system risk management activities.

Benefits: This project will contribute to system safety enhancements across the NAS, aircraft emissions and noise reduction, capacity, efficiency, and delay reduction.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$0.0
FY 2009 Appropriated	---	41,400.0
FY 2010 Request	---	66,100.0
FY 2011-2014	---	391,100.0 [1]
Total	Various	$498,600.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Human Factors	---	$10,000.0
2. Environment and Energy	---	7,000.0
3. New ATM Requirements	---	13,200.0
4. Operational Concept Analysis	---	10,000.0
5. System Safety Management	---	16,300.0
6. Wake Turbulence	---	2,000.0
7. NextGen Operational Assessments	---	7,500.0
8. Independent Operational Test and Evaluation	---	100.0
Total	Various	$66,100.0

[1] Future requirements are under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A09	**Next Generation Air Transportation System (NextGen) - Trajectory-Based Operations (TBO)**	**$63,500,000**	**Various**	**G-1A, G-1N**

FAA Strategic Goal: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: Trajectory Based Operations (TBO) is a shift from clearance based to trajectory based control. Aircraft will fly negotiated trajectories, and air traffic control moves to management by trajectory; the traditional role of the pilots/controllers will evolve due to the increase in automation, support, and integration. TBO focuses primarily on en-route and oceanic operations, although the effects of TBO will be felt in all phases of flight.

Currently, separation is handled by controllers using radar screens to visualize trajectories and make cognitive operational judgments, with some automation decision support to help identify and resolve future conflicts. With an increasing diversity of aircraft characteristics, using a single set of equipment-based separation standards for all aircraft encounters is becoming increasingly inefficient and limits capacity. This is especially true for aircraft (such as UAS, A380) that may need larger separations to maintain overall airspace safety levels. Human limitations constrain efficiency and expansion of service as sectors have shrunk to the point of diminishing returns in many places. Human limitations drive costs as well. An ability to handle more diverse traffic, with fewer impacts to operator desired performance profiles, while lowering unit costs as needed.

Flights are managed in today's system primarily by voice communication. Separation is handled by controllers using radar screens to visualize trajectories and make operational judgments. These judgments are turned into clearances often expressed as vector coordinates - all handled by two-way radio. Decision support tools aid the controller by predicting potential future conflicts and aid in evaluation but there effectiveness is limited by the use of voice – workload and voice limitations on complexity. Separation management remains much as it was when the radar was first introduced into the system. Human limitations constrain efficiency and expansion of service as sectors have shrunk to the point of diminishing returns in many places. Human limitations drive costs as well. A separation management that can handle more, diverse traffic, with fewer impacts to user desired performance profiles, while lowering unit costs is needed.

As demand has grown, especially in the airspace surrounding and between major metropolitan areas, the current fixed airspace routings and large separations limit airspace capacity and tactical management of major flows. En route congestion has become a major constraint on the system as the inflexibility of the system to airspace adjustments makes tactical flow in the face of demand congestion or major weather disturbances difficult. Due to the limitations in automated prediction capability and voice communication, separation standards remain, for the most part fixed and conservative, which restricts capacity to the overall system.

The current flight data management system and the current navigation systems do not support the flexibility that is needed from both a planning and execution perspective. Trajectory management means that true 4-D trajectories can be exchange and monitored and that the system can support the exchange of multiple alternative trajectories in both separation management and tactical flow. This requires a capability beyond that of the current flight plan which was developed in an era of human only interpretation and planning. Trajectory management and full use of the airspace also requires that aircraft can navigate off fixed routes and that new routes can be developed and published with minimum distances between. Keeping aircraft on historic routings with historic between route separations limits the use of airspace capacity in general and specifically to address weather and congestion limitations.

1. Separation Management - Separation Automation Enhancements (D-Side and R-Side) ($22,600,000):

Description of Solution: Currently, controllers using radar screens and limited computer decision support visualize trajectories to make cognitive judgments on how to maintain static separation standards between aircraft. The static separation standards allow humans to reduce the cognitive variability in this highly complex task to ensure separation. With an increasing diversity of aircraft characteristics, using a single separation standard for all aircraft encounters is becoming increasingly inefficient, and it limits capacity. Conflict Alert in ERAM is embedded in the Surveillance Data Processing (SDP) subsystem and has a short parameter time look-ahead (~90-120 seconds) based on a track-vector "Headlight" projection.

Performance-based services are a basic principle of NextGen: the more sophisticated the capabilities of the aircraft, the more likely the pilots can get their preferred trajectory. The performance-based concept calls for separation standards to vary according to aircraft capabilities and pilot training. This activity will result in a set of separation standards requirements and algorithms to implement them. This includes changes to automation, procedures, and training. This also funds an analysis of performance-based data processing to see if it is appropriate for lowering separation minima. Performance-based data processing is a way to integrate all information about an aircraft's path and location to provide full situational awareness and predict possible problems.

Developing new automation CA and CP algorithms and changing the controller workstations to support the new information are on the critical path of many NextGen technologies. Completion of this task enables successful completion of other TBO goals, as well as broader NextGen objectives.

2. Separation Management - Identify Cognitive Support and Display Change Requirements for Early Transition to a High Altitude Specialty ($7,000,000):

Description of Solution: This program is to develop the mid term automation decision support tool and display requirements for air traffic controller separation management in high altitude trajectory based airspace. It will identify cognitive support and display change requirements for early transition to a high altitude specialty and will develop and validate automation changes needed to implement a new high altitude operating concept that will create a more flexible high altitude airspace concept by increasing staffing flexibility, reducing training time, and enabling traffic peaks to be handled by fewer controllers. For FY 2010, $7,000,000 is requested to conduct research into operational requirements associated with cognitive support and display changes that provide local knowledge information on the controller's display or eliminate the need for local knowledge by automating the associated tasks. This work will evaluate whether the design is acceptable and meets the operational requirements needed to implement a new high altitude operational concept. Initial operational concept development and validation efforts have concluded that in high altitude airspace, the local knowledge information needed is considerably less than in lower altitudes (only 55 out of 102 knowledge items versus nearly 100% for other airspace) and that different operating strategies can be used to more dynamically adjust staffing and airspace to meet demand and reduce operating costs. By providing local knowledge through information accessible through the controller display and other tools, there will be increased flexibility in the assignment of airspace to controllers; increasing overall productivity and flexibility to deal with weather and congestion events. This program will work to define and develop the information display and decision support tool changes to provide this local knowledge and conduct human-in-the-loop simulations with controllers to assess the effectiveness of the information content and automation and display changes to enable rapid training (in terms of hours) of controllers to safely and efficiently control the airspace.

Benefits: The benefits associated with implementing a universal or generic high altitude airspace management concept will be increased flexibility in the assignment of high altitude airspace which will increase overall productivity and flexibility to deal with weather and congestions events. These changes will increase capacity, especially in reaction to congestion events and weather, and reduce FAA operating costs in the form of lower air traffic controller operations costs, lower air traffic controller training costs, and increased staffing flexibility.

3. En route Tactical Trajectory Management Point In-Space Meeting (TMA En route) ($7,900,000):

Description of Solution: This program will support the pre-implementation activities for en route point in space metering to include: concept engineering, maturity and integration assessment and final investment analysis for integration of point in space metering into the NAS. Specifically, the program will:

- perform concept development activities
- develop and analyze operational implications through simulations and human in the loop (HITL) exercises
- develop and evaluate demonstration/prototype capability
- investment analysis for final investment decision

For FY 2010, the program will continue to conduct simulation and HITL effort to refine and complete CONUSE documentation. In addition the program will initiate the evaluation of a demonstration capability and gather real world data in support of final investment decision.

4. Oceanic Tactical Trajectory Management ($13,000,000):

Description of Solution: Trajectory-based operations (TBO) are a critical NextGen capability that addresses the current flight limitations and performance gaps in the NAS, particularly in the areas of capacity, productivity, efficiency, and safety. TBO integrates trajectory planning, management, and execution across the spectrum of time horizons from strategic planning to tactical decision making. Strategic aspects of trajectory management include the planning and scheduling of user operations and the corresponding planning and allocation of NextGen resources to meet demand. Overall flows are managed strategically and tactically, as necessary, to ensure safety, security, and efficiency of operations. Tactical components of trajectory management include the evaluation and adjustment of individual trajectories to synchronize or limit access to airspace system assets. Separation assurance to provide safe separation among all aircraft is also included. The flexible management of aggregate trajectories enabled by TBO allows maximum access for all traffic, while giving advantage to those aircraft with advanced capabilities that support the Air Traffic Management (ATM) system.

TBO represents a shift from clearance-based control to trajectory-based control. In the new high-performance ATM environment, aircraft will transmit and receive precise data, to include aircraft routes and the times aircraft will cross key points in the airspace. With Data Communications, this same precise information will also be available to pilots and controllers on the ground. These improvements primarily result from the utilization of the new decision support capabilities, and the integration of traffic flow management.

For FY 2010, $13,000,000 is requested to expand these initiatives (Automatic Dependent Surveillance In Trail Procedures, Web-enabled Collaborative Trajectory Planning and 4 Dimensional Oceanic Trajectory Management) to other geographical areas, perform operational trials, further refine longer-term objectives including new initiatives to investigate separation assurance systems using Automatic Dependent Surveillance (ADS technology, and begin concept development activities for Oceanic Airspace Management – Trajectory Managed, Autonomous, Mixed Classic Airspace).

Benefits:

- Increased Capacity/Efficiency: Aircraft will fly more efficient, user-preferred routes. Increased system precision and enhanced automation support the more efficient use of flight levels so that aircraft can more closely fly routes that maximize the airlines' goals for fuel efficiency, aircraft operations, and schedule. Reduced separation standards for aircraft that provide state and intent data will lead to fewer predicted problems, and as a result, fewer diversions from the preferred routing. Reduced separation standards will also result in increased capacity within flow constrained airspace, allowing more aircraft to fly through those areas, rather than being rerouted or delayed to avoid them.
- Reduced Environmental Impact: Oceanic TBO 4-D trajectory optimization has the potential to provide significant fuel efficiencies and reducing aircraft emissions. Early trials in FY 2008 and FY 2009 validated the fuel savings for trans-Atlantic flights as part of the Atlantic Interoperability Initiative to Reduce Emissions. As a result of less fuel burns, the Oceanic TBO 4-D trajectory optimization will allow for reduced environmental impacts.
- Other benefits: In addition to supporting increased flows, TBO enables collaboration between the Air Navigation Service Providers (ANSP) and operators to maximize utility of airspace to meet ANSP productivity and operator goals. TBO is seen as a key enabler to increase ANSP productivity, so services can be provided at a much lower per operation cost. Around major airports, TBO is flexibly managed, significantly reducing the "footprint" of today's airspace to only the active arrival and departure corridors, and allowing improved access to other trajectory-based and non-trajectory-based flights in the vicinity.

5. Trajectory Management Enablers - NextGen DME ($6,000,000):

Description of Solution: This program will replace first generation solid state LPDME with new generation solid state LPDMEs. The LPDMEs will be implemented at new ILS locations. The availability of the new LPDME is greater than 99.95 percent, mean time to repair is less than one-half hour, mean time between failures is 14,231 hours, and mean time between outages is 15,193 hours. The new generation HPDME will allow for the decommissioning of all the VOR/DME/VORTACs, allow them to be located in fewer and the appropriate locations to support RNAV/RNP.

For safety reasons, the industry wants to discontinue step-down non-precision approach procedures whenever possible. The use of LPDMEs supports this operational goal for older, less-equipped aircraft, until these older aircrafts are outfitted with more advanced equipment

Benefits: The LPDME program maps to the FAA goal of Reduced Congestion by increasing airport capacity to meet projected demand. The equipment can handle more than 100 aircraft simultaneously, thus increasing airport capacity by a factor of two. Cost savings can be expected at a location by discontinuing relevant step-down non-precision approach procedures. Additional cost saving will be realized with the decommissioning of the VOR/DME/VORTAC infrastructure. For FY 2010, $6,000,000 is requested to fund engineering and technical services/initial support and begin procurement and installation activities.

6. TBO Trajectory Management - Conflict Advisories ($7,000,000):

Description of Solution: This program includes the analysis, prototyping and software development activities to implement conflict resolution advisories. Conflict resolution advisories will first be implemented using voice and data in a mixed equipage environment, and ultimately will be transmitted solely via data in certain airspace. The implications for changing controller roles and responsibilities will be explored and the requirements for automation, decision support systems and data communications will be identified. Modeling and analysis will be conducted to support benefits analysis and human in the loop simulations will be conducted to determine the impact on the controllers and pilots. Technical transfer activities are performed to transfer the CAASD solution to the system developer.

This line item provides the analysis, development and pre-implementation activities required to ease en route controller workload and eliminate controller tasks associated with determining conflict resolutions. It implements conflict resolution advisories, first over voice and data communications, and ultimately over data communications when equipage permits. It investigates the impacts of various equipage levels on the benefits associated with this solution as well as on controller workload and task performance. Future en route airspace will be subdivided to accommodate mixed levels of aircraft performance. High performance aircraft will directly connect via air-ground data communications to the flight management system, facilitating electronic data communications between the ATC automation and the flight deck automation. As a first step and in mixed performance airspace, the controller will still be responsible for aircraft separation by responding to problems predicted by the ATC automation. Instead of monitoring the sector airspace display to predict potential problems and mentally calculating problem resolutions, the automation will not only predict the problems but determine the best solution. The controller will transmit the solution via voice initially, and then via data link. This level of automation support helps manage controller workload as a means of safely dealing with the predicted increases in traffic volume. This program will prototype earlier and easier resolutions capabilities (such as pre-probed altitude and speed amendments) that can be transferred verbally by controllers and evaluate the impact these have on the Computer Human Interface (CHI) design and system performance and conduct research into more complex issues for future implementation such as vector advisories as well as the role of the human versus automation in voice clearance, mixed voice and data communications environments, and data communications only.

Benefits: Automated problem prediction and resolution will allow the controller to handle more aircraft because predicted problems will be resolved strategically, reducing the number of situations that demand multiple time-critical actions. The addition of data communications as the means to transmit resolutions to the aircraft will further reduce controller workload.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$0.0
FY 2009 Appropriated	---	39,500.0
FY 2010 Request	---	63,500.0
FY 2011-2014	---	134,000.0 [1]
Total	Various	$237,000.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Separation Management Modern Procedures	---	$22,600.0
2. Separation Management High Altitude	---	7,000.0
3. Trajectory Management En Route	---	7,900.0
4. Trajectory Management Oceanic	---	13,000.0
5. Capacity Management NextGen DME	---	6,000.0
6. Trajectory Management Conflict Advisories	---	7,000.0
Total	Various	$63,500.0

[1] Future requirements are under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A10	**Next Generation Air Transportation System (NextGen) - Reduce Weather Impact**	**$35,600,000**	**Various**	**G-4M**

FAA Strategic Goal: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: In today's National Airspace System (NAS), weather is responsible for 70 percent of delays over 15 minutes and contributes to 24 percent of accidents and 34 percent of fatalities. Up to 2/3 of weather delays are avoidable, based on a recent assessment completed by the FAA RE&D Advisory Committee. Despite a continuous flow of improvements available through aviation weather science and implementation solutions aimed at providing better weather information, the significant impact of weather on aviation remains. Weather is often the cause for delay and safety in NAS operations, and air traffic levels are expected to increase in the NextGen era.

Weather information is needed for air traffic management and flight operations decisions. These decisions range from the planning of individual flights, to the management of individual terminals and airspaces, to managing the capacity of the NAS. Collaboration among decision makers is required to resolve the constraints brought about by weather. Air Traffic Management (ATM), Flight Operations Center (FOC), and flight deck operational decision makers are unable to collaborate effectively in order to make the strategic and tactical decisions of the day. The current procedures for making these decisions are either labor intensive, and/or rely on multiple inputs in order to infer the required decision. The system is unable to support these decision makers due to gaps in today's weather dissemination system; incomplete, inaccurate, and inconsistent weather forecasts; and gaps and inaccuracies in weather observations used to depict current weather conditions and to support forecast generation.

Problems to be addressed in NextGen are:

- Weather information not accessible to all users and cannot be manipulated in accordance with user specific needs
- Clear, accurate, consistent, complete, and unambiguous aviation weather information not available
- Weather products lacking the spatial or temporal resolution required for decisions involving key weather phenomena that impact aviation
- Inability to automatically develop and display the impact of weather on current or future NAS capacity
- Weather data not well integrated into either manual procedures or automated decision support tools (DST)

Weather Problem for Weather Observation Improvements

The current weather observing infrastructure cannot provide the resolution required for the NextGen era. There are gaps as well as redundancies in the coverage of the atmosphere. The performance of these observing systems varies widely. The end result is an observing network which is not as cost-effective, accurate, or consistent, and cannot meet the needs for accurate user determination of the current conditions or for automated generation of accurate weather forecasts.

The demands of NextGen capabilities (e.g. Trajectory-based Operations, Super-Density Operations) drive the need for higher quality, more highly resolved, more adaptable observations of the airspace. To discriminate useable airspace from airspace closed off by flight hazards requires weather observations of the requisite coverage, refresh rate, accuracy, and spatial resolution. A full study to optimize the observational network for NextGen needs to be completed, but it is expected that fine-scale numerical weather models of the future will demand progressively higher resolution and more rapidly updated observational data.

Observations will be the foundation of NextGen weather services. The future state of the atmosphere cannot be accurately predicted without first assessing current conditions. Weather observations have two uses in the NAS: as primary data upon which to base tactical aviation decisions (e.g., avoid an imminent hazard), and as data inputs for numerical weather models and forecast algorithms. For instance, eddy dissipation rate observations from airborne sensors can serve both to provide warnings of turbulence hazards and to feed turbulence forecast algorithms.

The current observing network, including both FAA and non-FAA systems, is inadequate to needs of NextGen for the following reasons:

- Non-optimized observing platforms result in over-sampling in some areas, and data gaps in others. Especially in the upper air, observations tend to be scarce and not well distributed, rendering portions of the airspace unobserved. Without confirmatory observations areas of suspected hazard may needlessly close off large areas usable airspace.
- Observational data provide insufficient resolution. Resolution requirements for NextGen observations are not homogeneous across the national airspace, but are tailored to the domain, with higher resolution and frequent updates required near terminal areas, coarser resolution and less frequent updates needed en route and over the ocean. Overall, NextGen will require much higher resolution of current conditions than available from present sensors.
- Observational data is gathered (and sometimes over-gathered) inflexibly according to schedule, rather than adaptively, according to operational need. Adaptive control of network observations, whereby refresh rate and resolution of sensors are adapted in real time to meet dynamic changes in weather or decision -making requirements is needed. With adaptive control observational frequency will be event-driven, rather than schedule-driven, as is the case now (e.g., hourly surface observations, 12-hourly radiosondes, 30-minute satellite scans). When weather is benign, observational intensity can be relaxed. When weather presents a threat and/or when flight activity is heavy, more frequent, intensive observations will be required to support precise decision making. Adaptive control is a means of dynamically adjusting observational intensity where and when it is needed.
- Lack of an overarching observational strategy against which to evaluate emerging sensors technologies to make cost-effective decisions for implementation.

Weather Problem for RWI Weather Forecast Improvements

Current forecast capabilities are insufficient to meet the anticipated needs of DSTs and operational decision makers in the NextGen era for following reasons:

- Current forecasts lack the accuracy or resolution (both spatial and temporal) needed by users for decisions involving key weather phenomena impacting aviation.
- There is little data information to indicate the confidence level of weather forecast information with regard to specific airspaces or trajectories.
- The weather information provided is not in a form useable by ATM DSTs such as indices that indicate the severity of forecast weather conditions for various parameters (e.g., icing, turbulence) and the impact of the conditions on various aircraft types and configurations.
- Weather forecasts for the same phenomena impacting aviation are often inconsistent, duplicative, or do not correctly indicate the probability of forecast phenomena.
- The legacy processing systems are typically closed architectures, and incompatible with each other. They are limited in their ability to expand to ingest and process the massive amount of observation and modeling data needed to expand forecast horizons accurately to 8 hours or more.
- The system software is tailored to specific applications, which are tailored to single domains and limited in their ability to satisfy multiple domain users. The software infrastructure cannot be readily modified and new types of inputs cannot be accommodated.
- The weather infrastructure cannot support the integration requirements of NextGen. As stated above, the individual legacy components have satisfied the needs of single domains; however, a large user community demands an enterprise view to provide the overall capability needed by this weather community.

1. Weather Observation Consolidation ($5,500,000):

Description of Solution: Redyced Weather Impact (RWI) Weather Observation Improvements is tied to a set of NextGen operational improvements that define weather-related enhancements needed to realize the goals of the NextGen Implementation Plan. Improvements of the observational network will benefit other NextGen solution sets, including trajectory based operations, collaborative air traffic management, and high density operations. RWI Weather Observation Improvements will:

- Optimize observing platforms to include legacy and future systems. Determine the right sensor mix among ground, airborne, and other sensing sources to provide a more complete, consistent, and cost effective measurement of the atmosphere
- Provide observational data of requisite space and time resolution for NextGen. Focuses on an aviation weather sensor network that provides the spatial and temporal resolution needed to improve the quality of current and forecast weather impact information for all operational decision makers and satisfy NextGen aviation requirements
- Develop adaptive sensing technologies and strategies
- Develop an observational strategy to guide acquisition of emerging sensing technologies

For risk reduction and ease of transition these technologies will be evaluated for scientific correctness, safety, and operational suitability. Working with appropriate scientific, modeling, and user communities, current sensor information and dissemination short falls will be identified and evaluated. There will be efforts toward investigating technologies for optimizing, and improving aircraft weather sensing reporting. There will be evaluations for increased and improved use of satellite weather information. A subset of these candidate observation technologies will be targeted for early implementation and demonstrations of the viability of these technologies will be conducted.

For FY 2010, RWI Weather Observation Improvements will evaluate the current observation capability against the capability needed to support NextGen and develop a transition plan. RWI will conduct gap analyses to determine whether the appropriate sensor densities and performance exist, or are planned, and whether there are redundancies and/or sensing capabilities which are inconsistent. RWI Weather Observation Improvements will evaluate concepts for replacement of the various current weather radar networks, and will begin doing analysis on early prototypes concentrating on the evaluation of phased array technologies.

Benefits:

- Provides a more complete, consistent, cost effective measurement of the atmosphere
- Provides the required spatial and temporal resolution needed to improved the quality of current and forecast information
- Improved observation will improve forecast accuracy and timeliness enabling specific trajectory based operations and improve optimal routing and re routing

- Sustain capacity in bad weather:
  - Improved observation networks will improve forecast timeliness and accuracy and will enable specific trajectory based operations and improved optimal routing and re routing

- Reduced user costs (User-AOC):
  - Improved weather information especially pertaining to primary air routes and alternates, will reduce fuel costs and costs of aircraft cancellations and diversions due to unforeseen, adverse weather.
  - Improved weather information will reduce passenger delays

- FAA Safety Benefits:
  - Improved observations, provided for integration into operational decision making will improve safety by enabling pilots and FOCs to plan or re-plan around hazardous weather, and will enable ATM to plan or re-plan traffic flows around hazardous weather.

2. NextGen Weather Forecast Improvements ($29,900,000):

Description of Solution: RWI Weather Forecast Improvement is tied to a set of NextGen operational improvements that define weather-related enhancements needed to realize the goals of the NextGen Implementation Plan. Advanced forecasts will benefit other NextGen solution sets, including trajectory-based operations, collaborative air traffic management, and high-density operations. Specifically RWI Weather Forecast Improvements will provide:

- Transition to operations reliable, highly resolved forecasts of aviation-relevant weather that meet the needs of users and their decision support tools
- Forecast information in a form useable by ATM DSTs such as indices that indicate the severity of forecast conditions for various parameters (e.g., icing, turbulence) and the impact of the conditions on various aircraft types and configurations
- Scalable and expandable processor architecture serving multiple domains with capacity to support the intensive processing demands of advanced applications
- Portable, non-proprietary, open software applications to sustain legacy functionality and meet NextGen requirements.
- Probabilistic forecasts with regard to specific airspaces or trajectories
- Support to weather integration requirements of NextGen.

The capacity of the NAS has reached its practical limit. NextGen represents the plan to improve the ability of the NAS to respond to future demand. NextGen operations will enable expansion of today's capacity by using automation to better manage, among other things, the uncertainties associated with weather and minimize associated airspace capacity limitations. Improved forecast capabilities effectively integrated into decision support tools will provide the necessary information to effectively manage the NAS in adverse weather conditions.

RWI Weather Forecast Improvements FY 2010 activities involve preparation of forecast improvement packages using standardized software techniques for ease of implementation by DSTs. The FY 2010 effort is part of an evolutionary solution in which several major NextGen capabilities are planned with the first capability implementation beginning in FY 2013. This includes the evaluation of a 0-6 hour convective forecast, as well as evaluations of improvements to icing and turbulence forecast capabilities. Evaluation and engineering studies will be conducted to determine the most effective solution for a processing capability to support these advanced forecast applications. For example, the Weather and Radar Processor (WARP) will be migrated from current architecture to an enhanced architecture to support NextGen, including software modifications to modularize the system. The implementation of these changes will enable the replacement of legacy weather forecast system capabilities including CIWS and WARP. FAA will continue to support existing NAS users while evolving to these capabilities.

For FY 2010, $29,900,000 is requested to evaluate the 0-6 hour convective forecast application; evaluate and transition from Research and Development current and forecast 4-dimensional grids of icing, and ceiling/visibility; evaluate and propose recommended architecture for the NextGen Weather Processing capability; evaluations of prototype weather decision support tools; studies to develop severity indices for various weather parameters and calibration of indices to aircraft types; and assessments of the use of probabilistic weather forecast in ATM.

Benefits:

- Sustain capacity in bad weather:
  - Improved forecast timeliness and accuracy will enable specific trajectory based operations and improved optimal routing and re routing
  - Improved forecast storm cloud tops will enable more efficient use of high altitude airspace
  - Automated accurate forecasts of storm impacts out to eight hours or beyond will enable more advanced planning, efficient use of sectors and airspace, and decreased tactical re routing and diversions

- Improved FAA productivity and reduced TFM workload and stress by having improved weather impact determination via decision support tools:
  - Improved weather impact mitigation planning, and optimal sector loading

- Improved quality of controller decisions and reduce controller workload during bad weather, thus improving productivity.
- En route and terminal controllers will be able to provide precise and timely information on hazardous weather to pilots and to anticipate and quickly respond to pilot requests for deviations around hazardous weather.

- Reduced user costs (User-AOC):
  - Improved weather information especially pertaining to primary air routes and alternates, will reduce fuel costs and costs of aircraft cancellations and diversions due to unforeseen, adverse weather.
  - Improved weather information will reduce passenger delays

- FAA Safety Benefits:
  - Improved forecast accuracy and flight trajectory weather information.
  - Improved weather forecasts, provided for integration into operational decision making will improve safety by enabling pilots and FOCs to plan or re-plan around hazardous weather, and will enable ATM to plan or re-plan traffic flows around hazardous weather.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$0.0
FY 2009 Appropriated	---	14,400.0
FY 2010 Request	---	35,600.0
FY 2011-2014	---	317,800.0 [1]
Total	Various	$367,800.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Weather Observation Improvements	---	$5,500.0
2. Weather Forecast Improvements	---	29,900.0
3. Independent Operational Test and Evaluation	---	200.0
Total	Various	$35,600.0

[1] Future requirements are under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A11	**Next Generation Air Transportation System (NextGen) – Arrivals / Departures at High Density Airports**	**$51,800,000**	**Various**	**G-2A, G-2M**

FAA Strategic Goal: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The High Density Arrivals / Departures and Airports initiative is a program focused on the development of trajectory-based terminal operations and flow management in support of Next Generation Air Transportation System (NextGen). The primary goal of high density initiative is to increase the throughput of the nation's busiest airport terminal areas. The term "high density" is used to describe airport operations in which the spacing between aircraft has been reduced significantly below what is required today and what will be provided by the NextGen Flexible Terminal and Airports (see separate Resource Planning Data document). The High Density initiative expands on the capabilities of the Flexible Terminal and Airports program by developing traffic flow management and metering technology to provide greater throughput. Major areas of focus will include: 1) High density corridors with reduced separation to provide trajectory based transitions to match airport arrival capacity, 2) Enhanced surface technologies to support TFM, 3) Parallel Runway Operations with reduced lateral separation, 4) Digital taxi clearance and conformance monitoring for trajectory-based operations (TBO) and safety and 5) Expansion of terminal separation procedures throughout the arrival and departure airspace (Big Airspace). High Density operations encompass all operations from the gate to the en route structure and from the en route structure to the gate (Surface, Departures and Approaches). High Density Operations will require higher performance navigation and communication capabilities than those required for Flexible Terminal Airspace.

The Flexible Terminal and Airports initiative capabilities includes dynamically configurable airspace (flexible airspace) in conjunction with tailored arrivals and departures, development of "equivalent visual" approach procedures, digital aircraft communication (data link), surface trajectory management, low visibility taxi and departure operations, taxi conformance to enhance safety, collaborative decision support tools to enhance capacity, safety and efficiency. A major metric of this program will be increased capacity without a corresponding increase in human resources.

In addition to the developmental activities within the Flexible Terminal and Airports, the initiative will also leverage many ongoing FAA programs, including Automated Dependent Surveillance - Broadcast (ADS-B), Area Navigation / Required Navigation Performance (RNAV/RNP), Traffic Management Advisor (TMA), Traffic Flow Management (TFM), System Wide Information Management (SWIM), future automation interfaces and data communications efforts to provide greater capacity while balancing safety, security and environmental requirements. Other programs will need to be initiated to support High Density Arrival / Departure Terminals and Airports such as Surface Decision Support Systems (SDSS).

With increasing demand the need grows to achieve peak throughput performance at the busiest airports and in the busiest arrival/departure airspace. Capability improvement via new procedures to improve airport surface movements, reduce route spacing and separation requirements, and improve overall tactical flow management into and out of busy metropolitan airspace is needed to maximize traffic flow and airport usage. Essentially the problem is getting the right aircraft to the right runway in the right order and time to minimize its individual impact on the system and maximize the use of these airports. Thus operations are conducted to achieve maximum throughput while facilitating efficient arrival and departure. Inefficiencies in any aspect of the operation reduces the total use of the capacity and, because of high demand, causes excessive compounding of delay.

1. Trajectory Management - Surface Traffic Management (Requirements/Design/Integration/Safety/HF) ($15,000,000):

Description of Solution: Airport surface efficiency can be greatly enhanced using surface traffic management (STM) technology. STM is considered a critical step toward trajectory-based operations (TBO) on the airport surface, one of the NextGen High Density Airport solution sets. STM will provide airport decision makers with shared situational awareness along with decision support tools to assist in surface flow optimization. STM involves the use of surface surveillance data, airline data, and decision support tools to enable a collaborative information exchange among surface stakeholders. This technology can be readily applied to airports with existing and future ASDE-X installations. STM involves the shared situational awareness of all aircraft on the airport surface.

Trajectory Management - Surface Tactical Flow will be developed and deployed in multiple segments to bring capabilities to the NAS as they mature. The following segments are planned and include descriptions of the emerging capabilities:

Segment 1

- Collaborative Departure Scheduling – Includes advanced planning of assigned departure time, including opportunity for Flight Operators to manipulate the schedule for departure slots before flights push-back. ATC will consider schedule in Segment 1, but it will not be displayed directly to the controller.
- Coordinated Arrival/Departure Management – Tools to support ATC in selecting airport configuration and operational procedures to maximize efficiency and coordinate arrival and departure operations.
- Airport Situational Awareness – Demonstration of data exchanged between Flight Operators and ATC. Examples include updated push-back times, parking gate assignments, predicted arrival times.
- Management of Runway Assignments – Runway assignments will be managed through SDSS tools with limited decision support. In this segment, runways will primarily be assigned as the default runway for the departure fix and controllers/TMCs will be able to override the default.

Segment 2

- Departure Schedule in Electronic Flight Strips (EFS) – Electronic Flight Strips will be developed and implemented separately from Trajectory Management - Surface Tactical Flow. However, the collaborative departure schedule will be fully implemented by the controllers in the ATC Tower.
- Runway Assignment Decision Support – Advanced decision support tools from the SDSS will provide runway assignment advisories.
- Collaborative Decisions on Ramp and Gate Conflicts – The ramp tower and ATC tower will coordinate regarding arrival and departure flights that are in contention for parking gate or ramp resources.

Segment 3

- Taxi Route Management – SDSS will be used by controllers (possibly through EFS) to specify exact 2-dimensional taxi routes that are assigned to flights.
- Collaborative Outbound Taxi Metering – holding departures in their gates, or taxiing or towing aircraft away from gates to holding areas or unused taxiways, to reduce fuel burn while waiting in queues. This capability will also include handling of departure flights that need to push-back earlier to open the parking gate for an arrival flight. In such cases, SDSS will suggest a taxi route and sequence to be used on the airport surface so that the aircraft can be held on the surface and maintain the appropriate sequence.

Segment 4

- Taxi Route Data Link – Taxi routes will be data linked from the ATC tower to properly equipped aircraft
- Taxi Conformance Monitoring – Warning alerts in the ATC tower data linked to aircraft if the flight deviates from its two-dimensional trajectory. Properly equipped aircraft will use the data linked taxi route to perform taxi conformance monitoring on board the aircraft.

Segment 5

- Full Surface Trajectory-Based Operations – All demonstration flights will be assigned three-dimensional (2-D plus time) surface trajectories. The SDSS will develop the surface trajectories and ensure that they are conflict free. The time-based trajectories will incorporate planning of all airport surface sequencing including sequencing flights on the runway for departure, crossing of runways, and sequencing at intersections.

- Cockpit Support for Time-Based Surface Trajectories – Properly equipped aircraft will have avionics and displays in the cockpit that support proper trajectory control to conform to the time-based surface trajectory.

In addition to the developmental activities described above, this project will also leverage many ongoing FAA programs, including Automated Dependent Surveillance - Broadcast (ADS-B), Area Navigation/Required Navigation Performance (RNAV/RNP), Traffic Management Advisor (TMA), Traffic Flow Management (TFM), System Wide Information Management (SWIM), future automation interfaces and data communications efforts to provide greater capacity while balancing safety, security and environmental requirements.

<u>Benefits:</u>

- Increased capacity and reduced costs from reduction in delays due to better traffic flow on the ground and fewer delays.
- Reduced risk of runway incursion and increased situational awareness for pilots and controllers. Digital taxi clearances with conformance monitoring further enhances surface safety.
- Increased reliability and on-time performance of scheduled carriers. Delays are reduced, making ground operations more predicable.
- Fuel and emissions reduction due to shorter engine run times on the surface. Aircraft ground sequencing can be planned and predicted, then executed with minimum engine run time.

2. <u>Trajectory Management - CONOPS, Requirements, Standards, and Procedures for Taxi Conformance ($3,200,000):</u>

<u>Description of Solution:</u> Airport surface efficiency and safety will be greatly enhanced using surface traffic management (STM) technology with taxi conformance capabilities. Advanced taxi clearance delivery and monitoring provides an immediate improvement to the safety on the airport surface, and reduces the demand for controller voice communication. It is a critical step toward trajectory-based operations (TBO) on the airport surface, a critical part of the NextGen High Density Airport concept. Taxi conformance monitoring (TCM) will provide direct alerts to pilots when they have deviated from a taxi clearance and will provide alerts to the ground controller, as well. Direct alerts to the pilot improve safety by eliminating the need for the controller to inform the pilot of the deviation. Clear unambiguous displays of taxi clearances will improve situational awareness for flight crews and facilitate efficient operations even in periods of reduced visibility so airport capacity is not reduced.

The solution required to support TCM will provide an ATCT automation infrastructure to support additional enhancements in safety and efficiency. TCM will rely on electronic flight strip and other human-computer interface capabilities for the controller, as well as system-wide information management (SWIM). Using a digital delivery of taxi instructions ensures both ATC and the flight crew clearly understand the taxi route, hold points, and destination. By overlay of these instructions on a cockpit moving map and using alert logic, flight crews will receive constant feedback on the conformance to the taxi clearance.

<u>Benefits:</u>

- Improved tools processes and procedures reduce controller work load while satisfying safety and capacity requirements.
- Increased capacity and reduced flight costs due to a reduction in delays. Better traffic flow by ground traffic; fewer delays due to increased capacity.
- Increased safety due to reduced risk of runway incursions and increased situational awareness for pilots and controllers. Digital taxi clearances with conformance monitoring further enhance surface safety.
- Increased reliability and on-time performance of scheduled carriers. Delays are reduced and ground operations are more predicable.
- Reduced emissions due to shorter engine run times on the surface. Aircraft ground sequencing can be planned and predicted, then executed with minimum engine run time.

3. <u>Trajectory Management - Arrival Tactical Flow Management (TMA Extension and Integration) ($15,000,000):</u>

Description of Solution: In accordance with EA decision 44 and 57, the program will perform work in the following broad categories: concept engineering, development and implementation and engineering / investment analysis. Specifically, the program will:

- analyze architectural changes necessary to reconcile TFM and ATC trajectory models
- design the decision support automation necessary to apply and proliferate metering techniques
- integrate algorithms across multiple platforms
- develop and implement functionality needed to support NextGen concepts

For FY 2010, the program will: Analyze the feasibility of establishing metering from departure TRACON boundaries to arrival TRACON metering boundaries. Initial design and development for dynamic metering points, TRACON metering, a preview capability, and partial slot allocation is envisioned as early concept engineering models. Data exchange with external programs and capabilities, such as the Traffic Flow Management System, surface traffic management, and system-wide information management, will be analyzed. Computer-Human Interface and weather data improvements will be assessed. An initial concept of operations to meter with RNAV/RNP procedures will be completed.

4. Capacity Management - Integrated Arrival and Departure Operations ($18,600,000):

Description of Solution: Integrated Arrival and Departure Operations addresses the FAA's goal for capacity and the DOT Reduced Congestion Strategic Objective to "Advance accessible, efficient, inter-modal transportation for the movement of people and goods." It also supports the FAA's National Aviation Research Plan goal for a "Fast, Flexible and Efficient" system that safely and quickly moves anyone and anything, anywhere, anytime on schedules that meet customer needs. The program supports these goals by improving operational efficiencies in major metropolitan areas through expanded use of 3-mile separation standards and current minima for diverging courses in all arrival and departure airspace, as well as the use of visual separation standards above 18,000 feet, dynamic airspace reconfiguration of bi-directional arrival/departure routes, and improved traffic flow management. These operational changes will enable creation of additional area navigation arrival and departure routes. The program also calls for integrating arrival and departure airspace systems into one control service as well as one facility. This concept is a step toward the Next Generation Air Transportation System (NextGen) concept for Super Density Operations and a step toward General Service Delivery Points.

Implementation of these operational changes will require funding for airspace design and analysis, safety assessments, cost-benefits analyses, test site selection activities, automation trade-off analyses, concepts of use, computer-human interface studies and simulations, requirements development and validation, pre-production validation activities, transition strategy plans, procedures development, program management support, and the design, development and implementation of software changes including Surveillance Data Processing, Traffic Management Advisor, and Flight Data Processing upgrades and Computer-Human-Interface changes.

Benefits: Based on the rough order of magnitude concept validation cost-benefit analysis, implementation of this program at seven BA facilities covering eight major metropolitan areas was found to be highly cost beneficial, with an estimated benefit/cost (B/C) ratio of 6.8, based on the total estimated present value aircraft operating cost and passenger time savings benefits of $2,680 million and costs of $396 million. If passenger value of time was excluded from the calculation, implementation of the BA concept was still estimated to be highly beneficial, with an estimated B/C ratio of 3.8, based on total estimated present value benefits of $1,485 million and costs of $396 million. All sites evaluated are expected to be cost beneficial, with B/C ratios ranging from 2.8 to 11.7. The concept validation research also showed that this operational change would lead to a decrease in controller workload enabling more traffic to be handled with the same workload ratings as today, and decrease in the number of conflicts.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$0.0
FY 2009 Appropriated	---	18,200.0
FY 2010 Request	---	51,800.0
FY 2011-2014	---	141,000.0 [1]
Total	Various	$211,000.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Trajectory Management-Surface Flow	---	$15,000.0
2. Trajectory Management-Surface Conformance	---	3,200.0
3. Trajectory Management-Arrival Tactical Flow Management	---	15,000.0
4. Capacity Management-Integrated Arrival and Departure	---	18,600.0
Total	Various	$51,800.0

[1] Future requirements are under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A12	**Next Generation Air Transportation System (NextGen) - Collaborative Air Traffic Management (CATM)**	**$44,640,770**	**Various**	**G-5A**

FAA Strategic Goal: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: Collaborative ATM (CATM) covers both the strategic and tactical interactions with the customers to manage demand when the desired use of capacity cannot be accommodated. CATM includes the flow programs as well as collaboration on procedures that will establish balance by shifting demand to less desirable capacity alternatives (e.g., routings, altitudes, and times). The major demand and capacity imbalances will be worked collaboratively between the air traffic managers and flight operators. Critical to enabling this capability is information distributed by System-Wide Information Management (SWIM).

CATM represents an opportunity to evolve towards a fully integrated and tactically managed ATM system exploiting the potential of system support in a closed loop environment, while increasing opportunities for the exploitation of technical systems by human operators. Furthermore, CATM take a first opportunistic step in addressing the need to change controller focus to network needs rather than individual aircraft, and airlines need to provide an optimum profile to be followed by the pilot, providing for system stability.

The current system uses relatively blunt tools to manage demand and capacity imbalances. The tools do not "share" objectives for flights nor do they have a common picture of the structure and status of NAS. While great strides have been made in the management of flow, this lack of common objectives, status and structure constrains improvement. The system needs to minimize the over constraint demand and assure efficient operations once constrained. Constraining flights needlessly costs carriers and the traveling public time and money. On the other hand, failing to accurately forecast constraints and manage demand when they are warranted also generates costs. Users have limited ability to specify their preferred alternatives when a constraint is required; creating a need to allow input from them on resolving imbalance issues.

The overall philosophy driving the delivery of CATM services in the NextGen is to accommodate flight operator preferences to the maximum extent possible and to impose restrictions only when a real operational need exists, to meet capacity, safety, security, or environmental constraints. CATM strives to adjust airspace and other assets to satisfy forecast demand, rather than constraining demand to match available assets. If constraints are required, maximizing user opportunities to resolve those constraints, based on their own preferences, is a goal.

1. Flight and State Data Management – Common Status and Structural Data (Separation, Tactical, Strategic Trajectory Management) ($14,000,000):

Description of Solution: The Common Status and Structure Data program will address information and capability gaps within aeronautical information to achieve the NextGen shared situational awareness and trajectory based operations vision. Program activities will focus on 5 NextGen operational improvements:

- On-Demand NAS Information: Provide real time access to NAS status.
- Assignment of Airspace for Special Use in High Altitude: Better airspace management. Synchronization of airspace status.
- Continuous Flight Day Evaluation: Provide performance metrics real time.
- Provide full flight plan constraint evaluation with feedback: Provide new flight planning capabilities that consider NAS constraints.
- Trajectory Flight Data Management: Real time trajectory management accounting for all aspects of NAS including real time status and constraints.

To achieve these operational improvements, the program will address the following objectives and associated strategies:

- Objective 1: Deliver an integrated source of aeronautical information that supports tactical and strategic situational awareness.
    - Strategy 1: Develop harmonized conceptual and exchange models for NAS information including flow constraint information that supports tactical and strategic situational awareness.
    - Strategy 2: Orchestrate aeronautical information flows and processes to obtain high quality and timely information to support tactical and strategic situational awareness.
    - Strategy 3: Develop a capability to provide a common operating picture of the national airspace system to support tactical and strategic situational awareness.
- Objective 2: Deliver comprehensive pilot briefing and flight planning service incorporating NAS status and NAS constraint information that improves planning NAS operations.
    - Strategy 1: Provide a standard set of briefing and planning services that can be used by external and internal air traffic systems.
    - Strategy 2: Provide a GA Pilot Briefing Toolset
    - Strategy 3: Provide services and tools to support flight plan validation and filing based on complete NAS status information.
- Objective 3: Deliver forecasting and benchmarking operational performance tools to improve air traffic management.
    - Strategy 1: Develop a data warehouse of NAS information to support benchmarking and forecasting.
    - Strategy 2: Provide an executive information system to provide Business Intelligence (BI) capabilities to management and facilities for evaluating performance at the local and national level.
    - Strategy 3: Develop benchmarking, forecasting and real-time metrics and services to support tactical and strategic situational awareness.
    - Strategy 4: Develop tools to measure and monitor changes to the NAS that reduce or constrain NAS capacity and safety.

<u>Benefits:</u> Quantitative benefits have not yet been determined. It is expected that this program will claim a portion of the benefits attributed to operational improvements listed in section 1.2. Benefits are expected to be in the following areas:

- Safety
    - Reduction in accidents attributable to pilot briefing errors or missing information.
    - Reduction in accidents caused by violation of NAS flow constraints and restrictions.
    - Reduction in operational errors caused by airspace violations.
- Capacity and Efficiency
    - Airplane operator savings because of better information leading to improved flight planning and pilot briefing.
    - Airplane operator savings because benchmarking and forecasting reduces departure and en route delays.
    - ATC operational savings because of better information leading to improved traffic and flow management.
    - ATC operational savings because of access to near-real-time NAS performance information.

2. <u>Flight and State Data Management - Advanced Methods ($6,000,000):</u>

<u>Description of Solution:</u> NextGen will benefit from a number of infrastructure enhancements, procedural changes, and system improvements that will enhance capacity and alleviate congestion. These include improvements in the flight deck and avionics, vehicle performance, communications, navigation, flight planning (Flight Object), and air traffic control and management service provider capabilities. In the area of advanced methods for Traffic Flow Management (TFM), tools will be developed in this program; Integration of Weather, and TFM Flight Object and common indexing of NAS resources. These tools will help solve the problem of how to guide flights in capacity-constrained scenarios.

The integration of weather into TFM decision support tools will allow decision makers to identify flow problem areas due to congestion and severe weather. Once a problem has been identified, solutions can be developed and evaluated. Also, one of the keys to a more robust NAS capable of adapting to minimize the negative impacts of weather on capacity include flexible traffic management around weather constraints, improved weather and traffic (coupled) prediction, and increased situational awareness between the flight deck, the air navigation service provider, and the airline operational control.

The TFM Flight Object is a collection of common information elements describing an individual flight and available for use by both the NAS users and the ATM service providers. The flight object concept is based on sharing these common flight information elements among new and existing capabilities as the NAS evolves. Sharing common information elements improves the accuracy and availability of flight information updates, the consistency of flight planning in different Air Traffic Management (ATM) system domains and the transition of flights between domains and enhances the availability of user preferences and recorded history information.

A common NAS indexing system maps NAS resources into a common index for fast and efficient search and retrieval. Automation systems and decision support tools can probe the 4D trajectory against the NAS index system to test against outages, congestion areas, special use airspace, weather cells, etc. The retrieval of the information will be fast and efficient to support strategic operations.

Benefits: Key benefits for Advanced Methods for TFM include:

- Improved situational awareness for traffic managers
- Improved prediction performance for TFM decision support systems
- Improved decision heuristics for airspace demand management
- Coupled weather and traffic prediction
- Flexible TFM around weather constraints

3. Capacity Management- Dynamic Airspace ($6,300,000):

Description of Solution: Flexible Dynamic Airspace will reconfigure airspace for demand/capacity predictions to make as much airspace capacity available as possible, where and when it is required, which is fundamentally different from today's system where the airspace is a rigidly structured network of navigation aids, sectors, and special use airspace. The goal of Flexible/Dynamic airspace configuration research is to better serve users' needs by tailoring the availability and capacity of the airspace by creating a dynamic airspace configuration function that will provide the service provider a new degree of freedom to accommodate the airspace requests of users.

The Airspace Resource Management System (ARMS) is a distributed system which maintains the mapping of functional airspace volumes to frequencies and radios and in turn the mapping to operational positions. Any proposed change in airspace volume is tested by ARMS to ensure that there is radio coverage including testing for gaps. ARMS further supports the assignment of the new volumes to positions and provide the frequency map to the automation for display of frequency in support of handoff actions. Since ARMS is a national distributed system, the frequency, radio and airspace assignments to position can occur both inter and intra-facility. Triggering events for ARMS evaluation and change include: adjustments to airspace to offset weather airspace, load-sharing and load-shifting to maximize productivity, remapping of airspace in contingency and continuity operations, and long term collocations and consolidation considerations. ARMS will also manage NAS voice and data link communication links as well as managing ground to ground as well as air to ground communications.

Benefits: Key Benefits from Dynamic Airspace and Capacity Management (Flexible Dynamic Airspace, ARMS)

- Reduced controller workload
- Reduced coordination activities
- More balanced traffic
- Greater user flexibility
- Decreased fuel burn
- Reduction in delays
- Increased capacity

4. Flow Control Management – Strategic Flow Management Integration (Integration Execution of Flow Strategies into Controller Tools) ($6,000,000):

Description of Solution: Flight planners or an operator's flight planning automation interact with a common flow strategy and trajectory analysis service, available to all NAS stakeholders, that enables common situational awareness of current and projected NAS status and constraints. In addition to having common services to understand the potential effects on a trajectory or the effects of a flow strategy, operators and the ANSP can collaborate on the selection of both capacity management and flow contingency management strategies that balance NAS performance objectives with Flight operators goals. All of the parties have a common understanding of overall national goals and desired performance objectives for the NAS. A transparent set of strategies is in place to achieve overall performance objectives, including airspace management to maximize capacity when demand is high and, as required, flow management initiatives to ensure safe levels of traffic are not exceeded when capacity limits are reached.

Benefits: Key benefits from the collaborative environment in the NextGen include the following:

- Airspace operators benefit from improved collaborative decision-support tools, which better assess the potential impacts of decisions, reducing the likelihood of unintended consequences. Better decision support also increases the ability to maintain capacity in the presence of uncertainty. Less-conservative operational decisions are made because decision-support capabilities can better integrate large amounts of data over multiple time horizons.
- A larger percentage of operators will participate in the collaboration process than do currently. Today's process is characterized by poor information distribution capabilities and is limited by verbal negotiations. Flight operators gain benefits in efficiency, access, and overall performance, in addition to other national needs which are accommodated effectively.
- Because decision-makers will have more information about relevant issues, and improved automation tools, decisions can be made more quickly, required lead times for implementation can be reduced, responses can be more specific, and solutions can be more flexible to change.
- Information exchange is more clearly targeted to the appropriate decision makers, reducing workload and unnecessary actions by those not affected. Machine-to-machine negotiation replaces labor-intensive, voice, or text-based processes.
- Management of airspace security is integrated into overall collaboration and decision-making.
- Participants are assured of data privacy and protection, so that sensitive or proprietary information can be shared in a way that helps to achieve their objectives while improving overall ATM performance.
- Improved strategic capability based on dynamic information flows as opposed to static processes.

5. Flight and State Data Management - Flight Object ($9,000,000):

Description of Solution: An information sharing mechanism, such as the Flight Data Object, needs to be developed in order to enable information sharing among various users and stakeholders in the NAS this allows for better coordination, situational awareness, and collaborative decision-making. Flight Data Object supports trajectory based operation objectives to improve capacity, efficiency, safety, and cost. Flight Data Object will provide standard information to be shared across flight domains and user systems, and is envisioned to support more integrated and coordinated flow planning to ensure collaboration throughout the flight. Key parts of the Flight Data Object are:

- The information contained in the filed flight plan
- The converted (expanded) route with applied restrictions, routes, etc
- Flight plan trajectory (the 4D path the flight intends to follow)-includes crossing key aeronautical elements, such as restrictions, and volumes of airspace
- Aircraft actual trajectory (the 4D path the flight has been observed to follow thus far along with maneuvers it might take to get back to flying according to the original, filed intent)
- Mode S address or beacon code allocated to the flight
- Pairing information (to a track)
- Control information (current Flight Information Region (FIR) controlling, current local sector controlling, stages of handoff/ transfer of control, point-out information)
- Interim altitude assignments, holds, intent information, etc.

As the system evolves, the Flight Data Object should allow the evolution of shared flight information in such a way as to enable advanced operations. In particular, future concepts are being proposed that would require the following information elements:

- Aircraft parameters (e.g. weight, target airspeed, control mode) obtained via downlink to assist ground automation in predicting more precise aircraft trajectories.
- Four dimensional cleared trajectories. These need not be synchronized fully with the FMS trajectory. For certain airspace, trajectory-following performance may require these to be identical.
- Alternative and preferred flight paths and 4D trajectories. When a user does not obtain their preferred trajectory, preferred flight paths may be maintained in the Flight Data Object to allow reversion to these should an existing constraint be mitigated. Multiple alternative flight plans, paths and 4D trajectories could be maintained during a negotiation process.
- Operator preferences. While these have yet to be fully defined, a description of the operator's flight objectives could assist ground automation tools in selecting alternative paths. These may include elements such as: cost index, target descent speeds, level of turbulence to be avoided, required stabilization point on approach, flight priority information, etc. Some additional level of protection would be required for this information. Gate assignment information, taxi paths, runway assignments and preferences allow surface movement planning.
- Probability information. Pre-departure flight paths may be computed for advanced traffic flow management tools. These descriptions of the flight path can be maintained in a Flight Data Object Data Object.

Once a Flight Data Object is created, updates to flight data object will be based on the rules specified by the users. It is expected that, access rights to each part of the Flight Data Object will be determined based on the authority that each user has given the phase of flight

Benefits: The flight data object provides an opportunity for achieving increased operational efficiency by sharing common flight information elements among many different ATM capabilities. Sharing common information elements using the flight object has a number of potential benefits:

- Facilitate NextGen gate-to-gate 4D collaborative flight management concept
- Facilitate NextGen global interoperability and harmonization
  - Common flight data objects contain all pertinent flight data
  - Optimized resource utilization
  - On-demand data transfer optimizing data loading for subscribers
- Ease of NAS-wide information sharing via SWIM
- Acceleration of future capabilities and technology development
- Increased situational awareness
- Accuracy and availability of latest flight information
- Consistent flight planning and transition in multiple ATM system domains
- Improved on-going traffic management initiatives and decision making

6. Flow Control Management - Strategic Flow Management Enhancement (Enhancing the Strategic Flow Program) ($3,340,770):

Description of Solution: Currently flow strategies developed from the various decision support tools used by the Traffic Management Units (TMU) are manually intensive because the tools are not integrated. Traffic Management specialists have to work out the impacts of multiple Traffic Management Initiatives (TMI), and the solutions may not be optimal because the current tools do not support analyzing the linkages between multiple TMIs. This project would allow TMU specialists to automatically explore various reroute options and the impact of multiple TMIs and how they fit with efforts to accommodate NAS customer preferences. By automating this process, much more rapid flight reroutes can be developed, which would lead to fewer delays and less congestion.

The primary goal of Air Traffic Management (ATM) is addressing demand/capacity imbalances within the NAS. The FAA needs to improve implementing Traffic Management Initiatives (TMI) such as Ground Delay Programs (GDP), Airspace Flow Programs (AFP), Ground Stops (GS), Reroutes, and Miles-In-Trail (MIT). To improve TMIs, more sophisticated modeling capabilities will be used to assess the impact of implementing a combination of TMIs, determine the value of user feedback data, and project the impact of TMIs on overall NAS efficiency. The modeling results will be shared with the aviation community when evaluating these initiatives. Automate and enhance post analysis capabilities can feed the results back to the TMU originating the initiative. This project provides a solution that allows electronic negotiation with aviation users to manage congestion.

Benefits: Key benefits from Strategic Flow Management Enhancement

- Reduced delays and smaller buffers improving resource utilization
- Better integration of stakeholders leading to improved business processes
- Increased predictability and flexibility leading to better access for business users

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$0.0
FY 2009 Appropriated	---	27,700.0
FY 2010 Request	---	44,640.8
FY 2011-2014	---	205,000.0 [1]
Total	Various	$277,340.8

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Common Status and Structure Data	---	$14,000.0
2. Advanced Methods	---	6,000.0
3. Dynamic Airspace	---	6,300.0
4. Strategic Flow Management Integration	---	6,000.0
5. Flight Object	---	9,000.0
6. Strategic Flow Management Enhancement	---	3,334.8
Total	Various	$44,640.8

[1] Future requirements are under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A13	**Next Generation Air Transportation System (NextGen) - Flexible Terminals and Airports**	**$64,300,000**	**Various**	**G-6A,G-6N**

FAA Strategic Goal: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: Flexible terminal airspace and airports provides the capability to dynamically change airspace and airports to provide greater capacity, efficiency and safety. Today airspace is static while in the future terminal airspace and airports will be dynamically managed. Aircraft will have to be appropriately equipped to operate in Flexible Airspace.

Flexible terminal airspace and airports encompasses the majority of the terminal operation areas and airports within the NAS. It is anticipated that all high-density terminals and airports will be capable of flexible operations when demands warrant. At terminals and airports where traffic demand decreased from high-density to a lower density, the operations will "flex" or transition to lower density operations. Lower density operational requirements are not as stringent as high-density operations affording greater access to a wider class of users, while still maintaining equivalent levels of safety and efficiency. Both trajectory-based and classic operations may be conducted within flexible terminal and airports. It is anticipated that a significant number of airports will remain exclusively classic in operations.

Flexible Terminals and Airports include activities to improve both pilot and controller situational and the general use of RNAV/RNP routings. Operations within flexible terminal airspace and airports are a mix of IFR/VFR traffic with aircraft types ranging from airline transport to low-end general aviation. Airports in these areas are towered and non-towered, depending on the traffic demand. In the future many of these airports will experience higher traffic demand due to a migration of air traffic to smaller satellite airports in high population areas in the effort to avoid traffic congestion. In addition, there is a renewed interest in personal transportation including the increase in personal aircraft for pleasure and business and the emergence of on-demand air taxi services utilizing very light jets (VLJs). The Flexible Terminal and Airports initiative will meet the requirements of both the high and non-high density terminals and airports. It is anticipated that some low density / low complexity (usually class C and D) airports will remain classic.

Flexible terminal operations are a mix of Instrument Flight Rules (IFR) and Visual Flight Rules (VFR) traffic with aircraft types ranging from airline transport to low-end general aviation. Airports in these areas are towered and non-towered, depending on the traffic demand. In the future, many of these airports will experience higher traffic demand due to a migration of air traffic to smaller satellite airports in high population areas in the effort to avoid traffic congestion. In addition, there is renewed interest in personal transportation including the increase in personal aircraft for pleasure and business and the emergence of on-demand air taxi services utilizing very light jets (VLJs).

Inflexible airspace structures, reservations and routes have resulted in the inefficient use of airspace and the airports themselves. The continuing growth of aircraft air and ground movement is projected to exceed the capacity of the system, causing serious delays and gridlock. This has required the need for improved terminal area management.

A primary NextGen objective is the ability to achieve the most efficient use of airspace and airports based on actual needs and, where possible, to avoid permanent airspace and route segregation. In addition to the adaptation of the airspace structure to traffic flows and the implementation of area navigation, a major objective strategy is the implementation of the flexible terminal airspace concept on the airport surface.

1. Separation Management - Departures Wake Turbulence Mitigation for Departures (WTMD) ($19,000,000):

Description of Solution: NextGen Flexible Terminal Environment - Wake Turbulence Mitigation (WTM) includes several research spin-off activities including this WTM for Departures (WTMD) program. NASA studied wake turbulence formation, dissipation, and transport properties in order to detect and predict the presence of wake turbulence near runways. Based on research findings, techniques are now available to safely determine when reduced time separation to allow wake turbulence to dissipate between departing aircraft on Closely Spaced Parallel Runways (CSPR) would be appropriate. Reduced waiting time to depart provides more capacity over time, especially valuable at times of peak demand. Ten Operational Evolution Plan (OEP) airports are candidates for WTMD service. WTMD service is derived from a Wind Forecast Algorithm (WFA) that ingests both current, local surface wind observations from the FAA Automated Surface Observing System (ASOS), and local, low altitude wind forecasts from the National Weather Service, Rapid Update Cycle (RUC) model. A steady and favorable crosswind in relation to the CSPR is sufficient to safely allow less waiting time between departures, than is mandated without WTMD information. WTMD will notify ATC Supervisors when crosswinds are favorable. The ATC Supervisor may then opt to allow reduced departure spacing. WTMD will alert ATC Supervisors and Local Controllers when favorable crosswinds cease. WTMD technical alternatives address options on how the WFA may be hosted and how the WTMD information will be displayed on existing ATC Tower "glass." Reuse of existing NAS display/processor systems to host WTMD may prove cost effective.

Benefits: The WTMD Program offers approximately $20 million per year in Airline Operator Cost (AOC) savings and approximately $30 million per year in Passenger Value of Time (PVT) savings (ATO-R estimate) once implemented at ten target sites. The business case will multiply the annual benefits over years of service life (till 2032) and apply economic factors for then-year, risk adjusted dollar values by site. Precise cost estimates per site will also be estimated. Positive B/C ratio with margin will indicate whether a site is justified to obtain WTMD service. At present 17 OEP airports have closely spaced parallel runways (CSPRs). Preliminary down selection leaves 10 targeted OEP airports as most likely to enjoy a positive B/C ratio based, in part on how often they reach peak departure demand. Runway operational trends now allow independent operation if parallel runway centerlines are apart by 3,000 feet or greater. Insufficient surveillance response time to respond to position errors dictates that CSPRs may not operate independently (wingtip-to-wingtip) Aircraft must stagger usage, alternating left and right on CSPRs. Safe departure from CSPRs behind heavy aircraft and their jet blast requires a waiting period to allow any wake vortices to dissipate. Wake vortices drift down wind. If steady crosswinds of sufficient speed are present, the downwind runway wake can be predicted to move away from the upwind runway, dissipating and relocating much faster than usual under calm wind conditions. Safe departure spacing/timing on the upwind runway after a heavy downwind departure may be lessened, if a reliable means of keeping track of favorable crosswinds in relation to the CSPRs is provided to ATC Supervisors. WTMD alerts ATC supervisors of favorable crosswind conditions. ATC Supervisors may opt for shorter waits. Less wait amounts to less delay, more capacity, less fuel consumption quicker taxi time, shorter ground holds, and greater terminal efficiency promoting higher peak demand

2. Separation Management – Closely Spaced Parallel Runway Operations ($6,000,000):

Description of Solution: Closely Spaced Parallel Approaches (CSPAs) will develop functional architecture and functional requirements for independent and paired approaches. This initiative will identify potential alternatives for meeting functional requirements such as; application of new technologies to current standards, revalidation of the blunder model for today's environment and the transition to NextGen, and application of emerging technologies to current standards. Finally, CSPAs will identify areas where research, simulation, and demonstrations should be conducted.

Benefits: CSPAs will provide the following benefits:

- Higher quality of surveillance without fundamental change in current procedures
- Maintain airport/runway capacity in lower visibility conditions
- Improve NAS efficiency
- Decrease user operational costs
- Decrease emissions
- Instantaneous awareness for both Pilot and Controller of blundering aircraft

3. Flight and State Data Management – Surface, Tower, and Terminal Systems Engineering ($21,000,000):

Description of Solution: In support of the Surface Traffic Management Initiative, this task will analyze concepts and methodologies to support more efficient and safer movement and control of air traffic in the terminal airport arena and ensure smoother transition into and out of the NAS operational airspace.

Initial surface scheduling improvement enhances surface operation at target airports through automation-assisted surface management. Surface operations are improved by expediting surface traffic movements and reducing departure queues.

Efficiency of surface movement is increased through the use of automation, on-board displays and data link of taxi instructions on arrival and departure to properly equipped aircraft to reduce delay and environmental impacts and improve safety. It assumes development of surface automation that is fully integrated with airborne operations and applies this to surface management operation. Surface optimization automation includes activities such as runway snow removal, aircraft de-icing and runway configuration. Automation optimizes surface throughput and data links taxi instructions to aircraft.

Arrival and departure flows and surface operations are more effectively planned and managed through integrated advanced decision support tool. This develops an Integrated Arrival/Departure and Surface Traffic Flow Manager for improved decision-making and flow management. These decision support tools enable flow managers to work collaboratively with flight operators and with flow contingency managers to effectively manage high-capacity arrival and departure flows in the presence of various weather conditions. Real-time information distribution enhances operational efficiencies, such as distribution of runway breaking action reports. The arrival/departure decision support tool will make more efficient use of runways through real-time depiction of arriving and departing aircraft. The improvement increases efficiency of arrival, departing aircraft and safety of surface traffic movement, with corresponding reduction in environmental impacts which will lead to a reduction in delays.

Benefits: The objective is to develop concept and decision support tools to improve management of airport arrival/departures. In addition this program will integrate surface surveillance, automation, terminal weather systems and overhead traffic flow management. Near term benefits are minimization of taxi-out delays which will lead to reduced fuel-burn emissions and overall environmental impacts. Airlines will benefit from less fuel consumption on the runways and decrease their operating cost. Arrival/Departure Management Tools will eliminate "stalled aircraft" in active runway queues (due for example to weather blockage on filed departure route). Accurate "off-time'" estimates improve NAS demand predictions) DMT will optimize usage of down stream resources for available departure routes, fixes and gaps in overhead stream.

- Improved real-time information distribution across the NAS
- Enhance operational efficiencies to both the user and the service provider
- Will improve efficiency and use of runways, taxiways and gate operations
- Enhance trajectory based operations and overall surface operations leading to a reduction in delays, improved safety and increase airport throughput.
- NAS capacity will be increased.
- Delays and fuel consumption along with the impact on the environmental footprint will be reduced.

4. Trajectory Management – Arrivals (RNAV/RNP with Three Dimensions and Required Time of Arrival) ($7,000,000):

Description of Solution: As the FAA transitions to NextGen, aircraft will increasingly be assigned to Required Navigation Performance (RNP) area navigation (RNAV) routes and have modern avionics that include Flight Management Systems (FMS) capable of executing Required Time of Arrival (RTA) instructions. The RTA capability provides a powerful time-based control mechanism for use with the trajectory-based operations concept. In particular, RTA's have the potential for common use during certain situations such as management of arrival traffic to an airport. Time-based metering is a key scheduling technique for use in managing arrivals and employment of the RTA capability at an arrival-oriented waypoint (such waypoints could include top-of-descent, an arrival fix during the descent, and the runway threshold) can provide a mechanism to implement the scheduled times. The use of RTAs is attractive in that they take advantage of existing capabilities expected to become more widespread throughout the fleet. The FMS computes a cost benefit change to the original trajectory to meet the RTA. In addition, the FMS can "independently self deliver" to the RTA, thus reducing significantly the coordination needed between the user and ATC. Finally, since the FMS actively and directly "controls" the aircraft to meet the RTA, very accurate arrival is possible with minimal human intervention.

<u>Benefits:</u> RNAV/RNP with 3D and RTA will:

- Reduce controller workload and improved productivity
- Enhance reliability, repeatability and predictability of operations, leading to increased throughput.
- Increase schedule reliability through more consistent access and throughput in all weather conditions
- Improve efficiency and flexibility by increasing use of operator-preferred trajectories NAS-wide, altitudes.

5. <u>Separation Management - Approaches (Ground Based Augmentation System) ($7,000,000):</u>

<u>Description of Solution:</u> LAAS will provide all-weather approach capabilities to aircraft within line-of-sight distances from airports using GPS error corrections and integrity information. The corrections are delivered to aircraft via a very high frequency (VHF) Data Broadcast (VDB) signal.

LAAS will satisfy the all-weather approach and landing (as well as surface navigation) capability with significant improvements in service flexibility (i.e. capacity), safety, and user operating costs. High quality navigation services will be provided with a minimum investment in ground facilities compared to existing technology, resulting in savings to the U.S. Government. Aircraft operators will benefit from reduced fuel expenses due to more direct terminal area routing and improved access to airports during extremely low visibility operations.

LAAS will allow for increased flexibility in the Terminal Area by eliminating the capacity constraint due to ILS critical areas and allowing reduced aircraft separation in all weather conditions. Similarly, LAAS would allow for increased capability to the air traffic management system by providing the capability to use continuous descent approaches and curved-segmented approaches in extremely low visibility conditions.

A single LAAS system will be capable of providing precision approach capabilities to multiple runways. LAAS can provide precision approach service to all runways at those airports, including those not currently served by ILS. LAAS can also be installed at airports that currently do not have precision approaches due to ILS siting constraints.

The FAA to continue analysis and testing necessary to validate Category-III ground facility requirements and assess acquisition risks. This work will consist of requirements maintenance, preparation for investment decisions and initial solution development activities.

<u>Benefits:</u>

<u>Cost Avoidance</u> **-** The FAA will incur lower annual maintenance costs for LAAS, as a single LAAS ground installation will service all runway ends at an airport compared to the current technology that requires multiple ILS systems at a given airport. With LAAS, the FAA will obtain cost avoidance benefits of reduced maintenance and life cycle costs, and avoid re-capitalization of aging ground base navigation systems (ILS< VOR<DME&NDB).

<u>Productivity</u> **-** LAAS eliminates ILS critical areas. This reduces arrival and taxi delays. LAAS will maintain VMC/MVMC airport operations in IMC. LAAS in combination with RNAV and RNP procedures will allow for predictable flight paths in the terminal area which could potentially reduce pilot controller communications workload and the variability in the time and distance flown in the terminal area and lead to more flexible routing.

<u>Savings</u> **-** A single LAAS Ground Facility (LGF) can provide service to all runways ends at an airport compared to the need to purchase and install a separate ILS for each runway end at an airport. The number of ILS systems and their design complexity makes the ongoing costs of supporting these systems higher than those for LAAS. A LAAS cost analysis was performed in 2006 with the purpose to establish the potential long-term cost benefit of the Local Area Augmentation System (LAAS). The study demonstrates that net life-cycle cost

savings begin to accrue if two ILSs are divested for every one LAAS station installed at each of the 118 identified airports. The net life cycle cost savings for a most likely LAAS cost scenario is $300 million, with end-state annual cost savings of $20 million. Any additional ILS divestment represents additional cost savings over the timeframe of the model.

User (Airlines) **-** LAAS will reduce the number of flight disruptions in a terminal area by improving ceiling and visibility minima. Lower minima can result in fewer flight cancellations, fewer diversions to alternate airports, and fewer inclement weather delays. The LAAS can provide fewer arrival and taxi delays than the ILS. LAAS can permit takeoff operations in low visibility, which reduces departure delays for properly equipped aircraft. LAAS in combination with RNAV and RNP procedures will allow for predictable flight paths in the terminal area which will lead to more flexible routing in the terminal area, reduced fuel cost, and reduced flight times. LAAS may also reduce a pilot's workload by requiring fewer communications with ATC. The recent LAAS benefits analysis performed by IBM quantified the Airlines Direct Operating Cost savings to be $638.9 million over 20 years.

User (Passenger) **-** A reduction in flight time equates to savings for both airlines and passengers. LAAS will reduce the number of airline disruptions (delays, cancellations, and diversions). The amount of savings to passengers was quantified by IBM in the LAAS Benefits Analysis as Passenger Time Savings (PTS) and was estimated to be $795.8 million over 20 years.

The benefits to NextGen are increased flexibility in the Terminal Environment to enhance pilot and controller situational awareness and improve surface event management. The activities support providing initial aircraft-to-aircraft ADS-B applications, a low cost ground based augmentation system, environmental sensitive and efficient procedures, and more. The "other than" High Density Airports which will see benefits for the NextGen investments are very important to system-wide efficiency and performance of the air transportation system as a whole. The ultimate goal of flexible terminals is to provide separation capabilities that support the full use of each runway in nearly all weather conditions. This is necessary for the highest density airports to meet demand and at lower demand airports to provide viable business cases to users as alternatives to using high density airports and/or providing new service to a community. Basic NextGen benefits achieved include:

- Increased efficiency of arrival and departure operations
- Improved usage of runway capacity
- Improved airport access
- Improved Safety

Other Benefits that GBAS can provide include providing precision approaches which are fuel efficient, with low noise and emissions to support access through high density airspace to the runway. The effort is to develop criteria for 4-D procedures with measurable objectives. These procedures provide for energy managed arrivals with a lower vertical containment than Continuous Descent Arrivals (CDA) and the required time of arrival (RTA) that supports effective flow management.

6. Separation Management - Approaches (NextGen Navigation Initiatives) ($1,500,000):

Description of Solution: This program will provide the required engineering studies, analyses and associated services to support continued development and updates to the Navigation Evolution Roadmap and the Navigation Business Plan, including strategy, schedules, resource estimates, and technical and operational impact assessment for navigation services. It includes the creation, development, and baselining of specifications and standards to support acquisition programs for navigation aids (VOR, DME and others) lighting and visual range equipment. These efforts are essential to the introduction of new technologies that will improve NAS performance and efficiency, reduce acquisition and life cycle costs, and allow realization NEXGEN benefits.

Benefits: Improved Efficiency: Reducing the number of navigation aids required to provide the required navigation services in the NASS and introducing modifications/improvements/ new equipment at sites where service meets user needs will allow for reduction in costs without reduction in service to NAS users.

Capacity and Delay: Navigation services are critical to maintaining and increasing capacity at airports throughout the NAS. We must ensure that operational requirements for en route routes and terminal procedures that are supported through the delivery of services that support Required Navigation Performance (RNP), Area Navigation (RNAV), and other standards. These new requirements are driving the evolution of navigation systems to support new, improved, and innovative service-orientated solutions that will be realized in new navigation aids designs, modifications and revisions to the existing FAA suite of navigation systems, and the ability to provide greater service reliably. In this manner we will help to ensure that navigation equipment issues will not result in operational delays. Benefits will be are calculated by comparing the capacity/delays (+/-) before or without the availability of the navigation services provided with the capacity/delays when the navigation services are available.

7. Separation Management - Approaches (Optimize Navigation Technology) ($1,500,000):

Description of Solution: The solution for this situation is two fold. A short term fix is to design, test, manufacture, and implement direct replacement LED lamps for five hundred (500) of the nearly one thousand (1000) MALSR type systems in the NAS. A longer term solution to this problem is to redesign, test, manufacture and implement a new LED based MALSR system that uses solid state switching and electrical power distribution systems.

For the Visual Glide Slope Indicator (VGSI), the solution for Visual Approach Slope Indicator (VASI) and older Precision Approach Path Indicator (PAPI) systems are to design, develop, and manufacture LED PAPI based technology. The new LED PAPI systems that uses solid state switching and electrical power distribution systems will be procured and install in the NAS to replace over 1,200 VASI with PAPIs, with priority given to VASIs located at international airports. The FAA still has approximately 75 VASIs to replace at international airports and approximately 956 other VASIs to replace. A preliminary cost benefit analysis determined that it is very cost beneficial to implement LED technology into visual glide slope systems such as VASI and PAPI. The return on investment of going to LED technology is 41 percent per visual glide slope system and a break-even point will be achieved in 2.4 years. For example, the yearly saving per system is $2,781,300 on an investment of $6,710,000 (the anticipated cost difference of $30,000 for a LED PAPI system versus $23,290 for an incandescent system). The percentage of savings attributed to energy cost is 10.2 percent, to lamp replacement cost is 47.7 percent, and lamp replacement labor is 42.1 percent.

A procurement package has been prepared to design, develop produced LED PAPI systems.

Benefits:

- Reduce Power Consumption.
- Longer Life (i.e., 50,000 hours vs. 2,000 hours)
- Low maintenance cost
- Reduction of installation cost (i.e., smaller wires, and less complex electronic control cabinets)
- Sharper Light Output

8. Flight and State Data Management – Avionics ($1,300,000):

Description of Solution: This project intends to conduct engineering and research towards the development of initial requirements, concept of operations, and certification standards for cockpit moving map avionics that support automated taxi delivery, conformance monitoring and surface separation management. This capability represents the cockpit component of the Trajectory Management - Surface Conformance Monitoring project. It also represents a stand-alone capability to support surface separation in NextGen Flexible Terminal operations.

This effort is designed to show the potential safety and workload benefits that can be achieved through a comprehensive taxi route management and conformance monitoring capability and support for surface separation. The end state will be a precise, unambiguous taxi clearance to be displayed in the cockpit, alerts to the flight crews to maintain conformance to the clearance, and overlay of surveillance information to assist in surface separation.

Benefits:

- Safety and efficiency improves with more automated visual information available in the cockpit and more information with increased precision available to air traffic control.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$0.0
FY 2009 Appropriated	---	37,100.0
FY 2010 Request	---	64,300.0
FY 2011-2014	---	164,200.0 [1]
Total	Various	$265,600.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Separation Management – Wake Turbulence	---	$19,000.0
2. Separation Management – Closely Spaced Runway Operations	---	6,000.0
3. Flight and State Data Management – Surface/Tower/Terminal Systems Engineering	---	21,000.0
4. Trajectory Management - Arrivals	---	7,000.0
5. Separation Management – Approaches Ground Based	---	7,000.0
6. Separation Management –Approaches NextGen	---	1,500.0
7. Separation Management – Approaches Navigation	---	1,500.0
8. Flight and State Data Management - Avionics	---	1,300.0
Total	Various	$64,300.0

[1] Future requirements are under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A14	**Next Generation Air Transportation System (NextGen) – Safety, Security and Environment**	**$8,200,000**	**Various**	**G-7A**

FAA Strategic Goals: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The Security Integrated Tool Set (SITS) is part of the FAA's Operational Evolution Partnership (OEP) and efforts to develop the Next Generation Air Transportation System (NextGen). Functional and technical requirements, spiral development plans, and cross-platform interfaces (e.g., linkages between SITS and other air traffic management automation) need to be developed. These capabilities would be provided to select FAA users, as well in a customized form to interagency defense and homeland security partners (e.g., Department of Defense (DoD), Transportation Security Agency (TSA), Customs and Border Protection (CBP)) through a secure network, which enables shared access to an aviation security Common Operational Picture (COP) or, at least, a User Defined Operational Picture (UDOP) drawing on a common data set; real-time collaboration on monitoring, vetting, and operational response; and coordinated consequence management. This network will leverage enterprise grade database, processing, communications, and Information System Security (ISS) systems to support simultaneous, secure, and geographically distributed access by interagency users.

As the Air Traffic Organization (ATO) has taken on rapidly expanding national defense and homeland security mission areas, a serious gap is widening between the ATO's security specific automation needs and the systems and infrastructure both available today and defined heretofore in the FAA's existing investment plans. The current technological tools used by the ATO are naturally focused on the organization's traditional safety and capacity activities. Since the 2001 attacks, the ATO has been forced to substantially adapt the use of existing systems (e.g., Traffic Situation Display (TSD) and Temporary Flight Restrictions (TFR) Builder) to support its security related missions. ATO has also leveraged very primitive tools such as the telephonic bridge used for the Domestic Events Network (DEN), which has become the primary mechanism used by over seventy agencies to maintain shared situational awareness of and coordinate operational responses to security incidents involving the National Airspace System.

While the ATO has been able to stretch the utility of these off-the-shelf systems, which were designed and deployed to enable safety and capacity functions, their inherent deficiencies as tools to effectively support security operations have become glaringly obvious. The lack of adequate aviation security focused tools, ranging from operational response systems to intelligence sharing and fusion mechanisms, has been highlighted by a number of Government Accountability Office (GAO) documents and other reports. Cited deficiencies include, but are not limited to: an inability to manage data on security incidents (e.g., violations of restricted airspace) to help "connect-the-dots"; the lack of automation to rapidly identify and track suspect flights using in-flight behavior, flight plan data, operator information, and flight trajectory in the context of security features (e.g., restricted airspace or proximity to sensitive ground locations); unavailability of a COP fusing data from multiple sources and agencies. Timely information can make a decisive difference in the outcome of an air security event. The safety and capacity centric systems currently available to the ATO security users and their interagency partners inadequately address this growing, critical gap.

SITS is bound by FAA's operational responsibilities inherent in the NAS mission and as specified in National Security Presidential Directive-47/Homeland Security Presidential Directive-16 (NSPD-47/HSPD-16). These initiatives mandate government-wide sharing of information among law enforcement and security organizations. SITS is currently the main effort underway to provide the link to and from the law enforcement and security organizations to share NAS information.

Since the terrorist attacks of September 11, 2001, national security concerns have heightened and airspace security efforts have become increasingly complex. FAA's primary mission is to ensure the safe and secure operation of the NAS. In this role, FAA is responsible for advising its security partners on the best risk based actions to mitigate potential threats to the air domain, providing the best possible response to an air domain security incident, and coordinating the action across the NAS. To carry out this responsibility requires the FAA's Air Traffic Security Coordinators (ATSCs) access a number of displays and data sources, correlate data, determine the trajectory of the flight of interest, identify potential physical ground or critical infrastructure assets that may be affected, and identify the operational status and air traffic situation across multiple NAS sectors in order to have the best picture of the situation. The ATSCs must also coordinate communications and responses among multiple Air Traffic Control (ATC) facilities with the goal of ensuring the continued safe operation of the NAS while minimizing the impact, mitigation, or response action will have on the NAS. Although there exists a variety of communication and coordination tools, aircraft situation displays, and security related databases, there is limited integration among these systems. Analyses and data correlation are performed manually and information sharing is currently limited to voice communication. In many cases these operations are costly, time-consuming, inefficient, and labor-intensive. Specifically, SITS has identified the following performance gaps:

- Shared Situational Awareness (SSA) and collaboration are limited
- Required decision support tools do not exist (inadequate support to make informed decisions)
- Required automated analysis tools do not exist (inadequate analysis for timely decisions)
- Inadequate alerting and update capabilities
- No locally independent and remote/mobile access capabilities (restriction of required information flows)
- Inadequate capabilities to assess NAS impacts of security measures
- Lack of metrics to analyze security operations effectiveness

<u>Description of Solution:</u>

- The Security Integrated Tool Set (SITS) will streamline security information processes, improve shared operational security situational awareness, and enable the agency to effectively collaborate with their air domain security partners.
- SITS will support the performance of FAA's air domain security responsibilities to facilitate secure air domain operations based on FAA goals (SMP Pathways 1 and 4) as well as NSPD-47/HSPD-16 mandates.
- The SITS effort aligns to the Next Generation Air Transportation System (NextGen) Concept of Operations and will provide the security infrastructure to support evolution to layered, adaptive security. This includes information sharing through net-enabled operations, flight-specific risk assessment and mitigation strategies, and a unified communications, command and control environment.
- These capabilities would be provided to select FAA users, as well in a customized form to interagency defense and homeland security partners (e.g., Department of Defense (DoD), Transportation Security Agency (TSA), Customs and Border Protection (CBP)) through a secure network, which enables shared access to an aviation security Common Operational Picture (COP) or, at least, a User Defined Operational Picture (UDOP) drawing on a common data set; real-time collaboration on monitoring, vetting, and operational response; and coordinated consequence management.
- This network will leverage enterprise grade database, processing, communications, and Information System Security (ISS) systems to support simultaneous, secure, and geographically distributed access by interagency users.

In FY 2008, NextGen funds were provided to initiate the Concept and Requirements Definition (CRD) phase for SITS, determine Airspace Security domain mission shortfalls, finalize the Air Domain Security Concept of Operations, initiate development of the SITS Concept of Use document, identify potential investment alternatives and system interactions/dependencies, develop preliminary operational requirements, initiate reference case and shortfall quantification.

In FY 2009, efforts include refine operational, user, and system requirements and operational concepts, initiate Preliminary Engineering Development (PED) activities, complete CRD phase, obtain Investment Analysis Readiness Decision.

For FY 2010, $8,200,000 is requested to conduct evaluation of PED candidate concepts and systems, refine operational concepts and requirements, and obtain Initial Investment Decision.

Benefits: The investment analysis is currently being planned; details will be added as they become available. It is anticipated that their will be a savings to the government (but not FAA) for the reduction in number of airborne intercepts by USAF aircraft and the number of false security alerts. In any event this program is needed to meet the requirements of NSPD-47/HSPD-16.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$0.0
FY 2009 Appropriated	---	8,000.0
FY 2010 Request	---	8,200.0
FY 2011-2014	---	36,000.0 [1]
Total	Various	$52,200.0

FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Security Integrated Tool Set	---	$8,200.0

[1] Future requirements are under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
1A15	**Next Generation Air Transportation System (NextGen) – Systems Networked Facilities**	**$24,000,000**	**Various**	**G-3F, G-3M**

FAA Strategic Goal: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The Next Generation Air Transportation System (NextGen) transforms the national air transportation system by establishing enhanced and expanded services through new technologies, policies, procedures, and methods of operation to meet future demand and avoid gridlock in the sky and at the airports. It redesigns the air traffic control systems to make them flexible, scalable, and maintainable. It breaks down the geographical boundaries that characterize air traffic control and leads to a more seamless view of traffic, organized not by geographically oriented sectors, but by aircraft trajectories. Infrastructure, automation, equipage, procedures, and regulations are designed to support this seamless operational concept and must evolve from a geographical focus to a broader air traffic management concept. This includes facilities and the personnel who staff them.

Today's air traffic system was built around 1960's radar technology and is constrained by its limitations. This geo-dependent model (communication constraints, hardware/software limitations, and available data distribution capabilities) dictated how many facilities were needed and their location. As a result of these limitations, the number of terminal and en route air traffic control facilities has grown to over 500. Security concerns, including location-based risks, distributed infrastructure constrained by legacy architecture, and disparate automation platforms, further challenge the air traffic control infrastructure. This results in operational inefficiencies, including capacity limitations and less than optimal business continuity planning (BCP) strategies. In addition, many of these facilities have aged to the point where repair and remediation would be financially unsound.

NextGen facilities must handle increased traffic in the future while managing costs, improving and expanding services, and transforming FAA en route and terminal facilities to facilitate NextGen operational improvements. The current system has built-in limitations in flexibility, cost of service delivery, and continuity of operations. Some smaller airports have limited service due to cost of service; creating a need to increase service in these locations, while reducing costs.

NextGen redesigns the air traffic control systems to make them flexible, scalable, and maintainable. It breaks down the geographical boundaries that characterize air traffic control and leads to a more seamless view of traffic, organized not be geographically oriented sectors, but by aircraft trajectories. Infrastructure, automation, equipage, procedures, and regulations are designed to support this seamless operational concept and must evolve from a geographical focus to a broader air traffic management concept. This includes the allocation of staffing and facilities to provide expanded services; service continuity; best deployment, management, and training of the workforce; and the use of more cost-effective and flexible systems for information sharing and back-up. Air traffic facility optimization is essential.

Since requirements for facilities are no longer geo-dependent and do not require proximity of air navigation services being provided to the air traffic being managed, facilities are sited and occupied to provide for air traffic management facility optimization. This may include collocating several facilities (e.g., air route traffic control centers (ARTCCs) and terminal radar approach control (TRACONs) within a single facility).

The Networked Facilities solution set focuses on delivering an infrastructure that supports the transformation of air navigation service delivery unencumbered by legacy constraints. Networked facilities will provide for expanded services; service continuity; and optimal deployment and training of the workforce all supported by cost-effective and flexible systems for information sharing and back-up. Traffic is assigned to facilities on both a long-term and daily basis with service continuity a foremost requirement. Business continuity is built into the system and provides for a more resilient infrastructure, better contingency operations, and a higher degree of service.

In addition, NextGen introduces evolutionary and revolutionary concepts of operation and new technologies into the air traffic system. As a result of this, implementation of NextGen requires extensive work in the area of early evaluations, concept development, and/or demonstration in a real-time environment without being encumbered by the fidelity of the NAS infrastructure.

1. Integration, Development, and Operations Analysis Capability ($3,000,000):

Description of Solution: This program continues the integration, development, and operations analysis capability, provides a real-time flexible, component/object oriented environment to develop and validate the broad framework of concepts, technologies, and systems introduced by NextGen. It provides for the ongoing conduct of early evaluations, concept development, and/or demonstrations in a flexible, real-time NextGen integrated environment that is unencumbered by the NAS infrastructure. It also provides the capability for these activities to be developed and validated in parallel to ongoing NAS activities and research. The program enables FAA to bring in technologies to conduct low and high fidelity high-value exercises. The integration, development, and operations analysis capability uses low fidelity java-based rapidly configurable interfaces and evolves into a high-fidelity capability in a controlled environment, emulates information flow and system performance characteristics, and is adaptable to illustrate and assess NextGen human-machine-interface concepts. An ongoing capability is required to conduct early concept validation, alternatives analyses, and requirements development.

In FY 2009 the program will focus on software and hardware requirements to establish an integrated environment to conduct early proof of concept, rapid prototyping, and technical demonstrations.

For FY 2010, $3,000,000 is requested to continue development of the integration, development, and operations analysis capability and focuses on support to develop iterative designs to evaluate concepts and alternatives; determine quantitative metrics to define and validate human performance, usability, workload, and safety indications; and to design and conduct experiments. Products include the development and validation of system prototypes, system analyses, definition and refinement of requirements, and candidate solutions to research questions. Additional software development, hardware integration, and assessments of available software modules for reuse in this environment are also required in FY 2010.

Benefits: This program provides for quick turnaround results and a more responsive capability to develop and validate requirements to facilitate transition of the broad scope of technologies to support NextGen evolution.

2. Future Facilities Investment Planning ($21,000,000):

Description of Solution: The NextGen Integrated Work Plan establishes a broad framework for the services, technologies, policies, procedures, and methods of operation that must be implemented by 2025 to achieve the national air transportation goals. This vision includes NextGen facilities as a key component of the strategy for supporting air transportation and enhanced operational decision making between now and 2025.

NextGen facilities are as much about change management as they are about reducing the number of facilities and cost. In order to facilitate the significant transformations and changes in roles and responsibilities of air traffic service providers, NextGen facilities are incorporated into the overall plan to achieve NextGen. Traffic is assigned to facilities on both a long term and daily basis with service continuity a foremost requirement. Moreover, the facilities are sited and sized to provide for a stable workforce environment with opportunities for career progression.

Since the flexible ground and air-ground communications networks negate the requirement for proximity of air traffic facilities to the air traffic being managed, NextGen facilities will be sited and occupied to provide for infrastructure security, service continuity, and best deployment and management of the workforce. This includes collocating several operational domains (e.g., en route, terminal) within a facility.

Information systems facilitate the monitoring of infrastructure health, remote maintenance, and system resilience to maintain service availability and automatically alert the community about the status of NextGen assets. One key transformations resulting from NextGen is the ability to continue to operate the system with the loss of a limited number of key operational facilities. Network-enabled operations and infrastructure management services provide continuity of operations in the event of a major outage (such as a major hurricane or terrorist event).

A flexible infrastructure service delivery is how changing user needs are met and cost-effective services are scaled up and down as needs change. It is the way to ensure that the service providers and the information (e.g., flight data, surveillance, weather) are readily available when and where needed.

To address this, the NextGen facilities investment planning program of networked facilities focuses on optimization of air traffic service resources. This includes the allocation of staffing and facilities to provide expanded services; service continuity; best deployment, management, and training of the workforce; and the use of more cost-effective and flexible systems for information sharing and back-up.

In FY 2009, an analysis of the full range of NextGen facility alternatives was conducted. This analysis included operational and service delivery implications as well as support for service transition and business continuity. An assessment of market capability was conducted and a preliminary program baseline established. These activities were conducted in support of the initial investment decision for NextGen facilities.

For FY 2010, $21,000,000 is requested to support activities that further advance the NextGen facilities investment planning activity. Funding will be used for support to prepare for the final investment decision. Products will include staffing studies, facility design, business continuity requirements, and facility-independent techniques and practices for decoupling service delivery from facility geographic location. In addition, key planning elements will be identified (e.g., development of systems and equipment, development of regulations, implementations of procedures, purchase of real property, etc,); requirements and plans for major risks that threaten achievement of performance, cost, schedule, and benefit objectives will be finalized; a strategy for procuring, implementing, and supporting the solution over its life cycle will be developed; and industry input will be solicited and evaluated to ensure the costs, identified risks, and schedules contained in the baseline are accurate.

Benefits: NextGen facilities investment planning supports optimization of FAA's air traffic service provider resources. It considers infrastructure alternatives and associated benefits such as that of a geo-independent service delivery model to optimize air traffic service, improve workforce security, and ensure continuity of service. Future facilities will provide for increased cost effectiveness through better matching of assets to demand and reduce the need for local surge buffers in personnel and equipment. Additional benefits include the following:

- Environments which support NextGen operational changes
- Seamless information exchange that increases flexibility and air navigation service provider agility to respond to demand
- Improved work environment and increased opportunity for career progression
- Reduced time and cost to train controllers and other personnel
- Facilities that meet Department of Homeland Security guidelines
- Reduced overall air traffic service provider costs while increasing the level of service

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$0.0
FY 2009 Appropriated	---	15,000.0
FY 2010 Request	---	24,000.0
FY 2011-2014	---	878,600.0 [1]
Total	Various	$917,600.0

[1] Future requirements are under review.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Integration, Development and Operations Analysis Capability	---	$3,000.0
2. NextGen Facilities Concepts and Requirements Definition	---	21,000.0
Total	Various	$24,000.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A01	**En Route Automation Modernization (ERAM)**	**$171,750,000**	**Various**	**A-01**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets project demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: En Route automation systems provide the foundation for FAA's air traffic control environment and are paramount to FAA's ability to implement new services and air traffic control tools necessary to improve efficiency and increase capacity. The current En Route automation domain comprises a mix of technologies that are the result of a piecemeal system evolution. The En Route Host Computer System is the heart, brain, and backbone of the National Airspace System (NAS). This mainframe computer provides the primary radar data processing and flight plan processing information necessary for air traffic controllers to separate aircraft and ensure the safe, expeditious movement of air traffic. The FAA can only maintain the Host Computer hardware through 2012, after which operational availability and maintainability will be at risk. En Route automation system outages during peak travel times can create a ripple effect that results in long delays and/or cancellations, and can paralyze the entire NAS.

Automation enhancements provide one of the few opportunities available to achieve productivity and efficiency gains that are necessary to deal with significant forecasted growth in operations without significant increases in controller staffing. While the Host and Oceanic Computer System Replacement program replaced the mainframe processors, the Host Computer software is still based on a dated, 30-year old architecture. Additionally, the current radar-position display processors deployed in 1998 are also reaching the end of their service life. Their processing power is less than a standard desktop computer and their resident graphics software language is proprietary and outdated. These hardware and software limitations progressively impede the FAA's ability to accommodate the steady, increasing demand for air traffic services that increase efficiency and capacity.

The current backup system, the Direct Access Radar Channel (DARC), provides only limited capabilities for air traffic controllers and no safety alert functions. As such, FAA imposes airspace restrictions whenever the backup system is engaged.

Today's threats make it imperative to approach information security in the en route environment in a holistic and systematic manner. Today's system relies on a mix of technologies cobbled together through 40 years of piecemeal investment developed before the introduction of modern information security standards and technologies.

Additionally, today's En Route system presents significant challenges in configuration management and documentation because of its multiple, disparate sub-systems and site-unique configurations. These challenges require complex testing and transition planning, increasing the effort required, and the risk to operations when fielding upgrades and managing airspace data. For example, in 2004, transition complexities that surfaced during relatively minor upgrades to the legacy Host computer system at three sites caused 300 flight delays.

Description of Solution: ERAM replaces today's En Route Host Computer System, its backup, and portions of the display system infrastructure, including the technical refresh of the Radar Position processor, to enable improvements in airspace capacity, efficiency, and safety that cannot be realized with the current 30 year-old system. ERAM will be fully integrated into the future NAS, providing flight information processing to terminal and approach control facilities. It also provides flight information and route processing to the traffic management systems that control the efficient flow of air traffic. ERAM has a fully functional backup system that simplifies system maintenance and eliminates the need for restrictions in the case of primary system failure. The ERAM program redesigned the display interface to support an open, COTS-based architecture. Its architecture is based on the En Route Communications Gateway and the Data Position display processor technical refresh. Failure to update the current Radar Position processors would leave a major bottleneck in ERAM's open system infrastructure. Attempting to deploy new ERAM infrastructure without new Radar Position processors presents unmanageable technical and operational risk during transition. For these reasons, the Radar Position technical refresh is included in the ERAM acquisition program baseline.

ERAM provides capabilities that the current Host cannot because of its technological and structural limitations, including restrictions on the number of flight plans that can be stored, the number of air traffic control radars that can be used, and flexibility in airspace configuration. ERAM provides a state of the art foundation and will introduce new capabilities that will enable improvements in air traffic control services. New capabilities such as flexible routing around weather, congestion, and traffic restrictions and automated controller-to-controller coordination will reduce controller workload and increase productivity. Airspace users will be able to file their intent earlier in the flight planning process, allowing air traffic control resources to be more efficiently allocated to handle anticipated workload, and end-to-end flight plan analysis will improve the predictability of proposed routing. National adaptation will reduce life-cycle costs of system maintenance and ensure a consistent level of service from facility to facility, and the use of international flight plans will allow airspace users to fly across national borders almost seamlessly.

ERAM also improves configuration management and adaptation, and reduces the complexity of system upgrades and maintenance. ERAM provides the technology and mechanisms to introduce real and effective information security to the critical air traffic control system.

The ERAM architecture and deployment plans assume the successful implementation of the projects comprising the En Route Automation Program. The En Route Communications Gateway (ECG) completed the replacement of the Peripheral Adapter Module Replacement Item (PAMRI) system, providing a modular and expandable system to support ERAM. Additionally, ECG supports state-of-the-art system architectures such as Internet Protocol and extensible data formats such as ASTERIX. The En Route System Modifications program replaces components and provides upgrades for operational display systems within the En Route environment. URET is a set of decision support capabilities that assist the En Route sector team in the strategic detection and resolution of predicted problems with traffic and adapted airspace. URET provides four key capabilities to the Air Route Traffic Control Centers (ARTCC): (1) Aircraft-to-aircraft conflict detection; (2) Aircraft-to-airspace conflict detection; (3) Evaluation of user or controller request for flight plan amendments or route changes; and (4) Enhanced flight data management - URET deployed at all 20 ARTCCs in FY 2006. These efforts address component obsolescence, system maintainability, current system operational performance improvements, and technical solutions that provide continued improvements to the NAS. Additional efforts include: Console Reconfiguration and Main Display Monitor (MDM) Replacement (CRMR), Data Position display processors technical refresh (DPOS) and Console modifications (Console Mods) to accommodate equipment to support ERAM. The CRMR effort was completed on April 12, 2005. The Data Position display processors technical refresh effort was completed during FY 2006 and the Console Mods effort is ongoing with completion in FY 2008.

In coordination with other en route programs, ERAM will accomplish a complex transition from the current system to a modernized en route system architecture while not impacting critical services. This transition will provide improved en route ATC capabilities and establish a modern and supportable environment, facilitating future capabilities and enhancements.

ERAM development and deployment is being conducted incrementally in order to reduce risk, provide early benefits, address equipment sustainment issues, and to ensure a stable system during the transition from the Host Computer system. The first step is the replacement of the Direct Access Radar Channel and the addition of safety alerts through the Enhanced Back-up Surveillance (EBUS) effort. EBUS introduces existing radar surveillance data processing software from the Microprocessor En Route Automated Radar Tracking System (MEARTS) into the En Route environment on the ECG processor and eliminates all of the existing DARC hardware/software. EBUS began deployment to Denver ARTCC (Key Site) and initial operations capability (IOC) was declared on April 24, 2005. Completion to all 20 ARTCCs occurred in FY 2006.

The next phase is the national deployment of the En Route Information Display System (ERIDS), an important tool for providing the early benefits of improved productivity and efficiency that distributes important information to air traffic controllers electronically. Reducing controller time spent accessing this information, and improving the quality control of the information will increase productivity and controller efficiency during periods of increased traffic loads. The investment analysis identified approximately $349 million in avoided staff time resulting from the implementation of ERIDS, reflecting the elimination of the manual labor required to process print, manage and distribute paper. ERIDS began deployment to the Salt Lake City (Key Site) ARTCC with initial operations capability (IOC) declared on June 7, 2006. National deployment was completed December 2007.

The third and by far most complex step (ERAM Release 1) is the replacement of the Host Computer System with new software and hardware and the integration of these elements within evolving En Route system architecture in coordination with the other elements of the En Route Automation Program. To mitigate risk, ERAM is leveraging existing FAA products and lessons learned to reduce cost, minimize deployment risk, and increase user acceptance. Specifically, Display System Replacement (DSR) forms the basis of ERAM radar controller display functionality; User Request Evaluation Tool (URET) forms the basis of the flight data processing, data controller display functionality, and conflict probe; Standard Terminal Automation Replacement System (STARS) radar data tracker provides a standard tracker; and Microprocessor En Route Automated Radar Tracking System (MEARTS) forms the basis for ERAM separation assurance and safety functions. This step will complete the delivery of a new automation system at each En Route Air Route Traffic Control Center in the continental United States. ERAM Release 1 national deployment begins in FY 2009 and will be completed in FY 2011. Finally, ERAM Releases 2/3 will contain software maintenance updates and further functional enhancements.

For FY 2010, $170,900,000 is requested to continue life-cycle system maintenance activities (On-site Support 1st Level Hardware Maintenance and 2nd Level Engineering Support and CDLS for installed ERAM systems. ERAM Release 3 and make it available for the sites. ERAM 2nd level engineering support, ERAM CDLS, ERAM On-Site Software Maintenance, and develops, integrate, and test ERAM Release 3. An additional $850,000 is requested for Independent Operational Test and Evaluation.

Benefits: The ERAM deployment will ensure the safety and continuity of NAS operations by replacing technically obsolescent and logistically unsupportable systems. ERAM provides a fully redundant backup channel to ensure system reliability and availability. ERAM is being developed with an open architecture that will facilitate meeting demands on the NAS for increased safety, capacity, and security as well as the inclusion of future enhancements.

Prior to budget year 2006, ERAM was captured as one of the projects under the En Route Automation Program budget line item. At the direction of the FY 2005 Conference Report, the following represents the funding request for ERAM only. The appropriation summary for prior years (FY 1982-2005) reflects the En Route Automation Program as a whole.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$1,641,412.7 [1]
FY 2009 Appropriated	---	203,050.0
FY 2010 Request	---	171,750.0
Baseline Requirement	---	302,400.0 [2]
Total	Various	$2,146,867.7

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. ERAM Release 1	---	$160,000.0
2. ERAM Releases 2/3	---	10,900.0
3. Independent Operation Test and Evaluation	---	850.0
Total	Various	$171,750.0

[1] Includes reduction for P.L.108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.
[2] Future requirement for technology refresh will be requested in a future budget.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A02	**En Route Communications Gateway (ECG)**	**$3,600,000**	**Various**	**A-01**

FAA Strategic Goal: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The En Route Automation Programs provide automation infrastructure improvements at the 20 high-altitude centers in the continental US. Five interdependent projects comprise the program: En Route Communications Gateway (ECG), Host and Oceanic Computer System Replacement, En Route System Modifications, En Route Enhancements, and En Route Automation Modernization. These automation systems provide the foundation for FAA's air traffic control system.

While modern equipment is being procured and fielded to replace obsolete system elements, legacy operational automation systems must still be maintained and interim updates must be performed to continue air traffic services today. Minimizing disruption to high-altitude, or en route, automation services is critical because outages can create a ripple effect that results in long delays and cancellations throughout the NAS.

The ECG system, which replaced the aging Peripheral Adapter Module Replacement Item, is fully operational nationwide. ECG is the first step in FAA's plan to replace aging automation systems with modern technology. The ECG system was procured using commercial-off-the-shelf (COTS) products. The performance gap is the short life-cycle associated with COTS products, which require more frequent technology refreshes. Sometimes, technology upgrades improve capability. The ECG program allows the FAA to monitor, maintain, and evolve the ECG system to take advantage of technical advances.

The problem therefore is to maintain the viability of the ECG system while the air traffic technology evolves, maintaining the service capability that ECG provides.

Description of Solution: The solution is twofold. First, the ECG acquisition team will remain a viable entity to continue managing the investment the government has made in providing a modern portal capability. Second, the team developed the ECG Sustainment and Technology Evolution Plan (STEP) to document the multi-year approach to maintaining the viability of the ECG system. This approach to sustainment and technical evolution combines purposeful, ongoing monitoring for obsolescence or evolution opportunities with proactive planning to identify the best alternatives and the best solutions to maintaining and evolving the ECG technical baseline.

In FY 2008, $4,000,000 was appropriated for ECG for program objectives in support of the FAA Flight Plan. This funding was used to ensure the ECG system remained sustainable and did not experience the type of obsolescence issues that plagued the predecessor system. Specifically this included:

$2,100,000 for Sustainment and Technology Evolution Planning activities
- $1,100,000 for execution of ECG Information System Security
  - $363,000 to maintain the ECG security profile through execution of the ECG Security Profile Management Plan
  - $737,000 for remediation activities associated with the completed Security Certification and Authorization Package dated August 2005
- $800,000 to carry out the analysis prescribed in the ECG Operational Analysis Plan.

In FY 2009, $7,400,000 was appropriated for ECG program to support program objectives in support of the FAA Flight Plan. This funding will provide for the following:

- To ensure sustainability of the ECG system and avoid the obsolescence issues that plagued the predecessor system, the ECG team identified potential issues that may require mitigation in FY 2009. ECG was appropriated $2,300,000 for ECG Sustainment and Technology Evolution Plan activities. $200,000 was appropriated for testing purposes to check for the viability of STEP recommendations in an operational environment.
- To ensure Program Support for the ECG Program, $1,500,000 was appropriated for support activities including OMB Exhibit 300, Earned Value Management, STEP, Operational Analysis, contract, and engineering. ECG Information System Security was appropriated $1,200,000. This will include remediation activities associated with the completed Security Certification and Authorization Package dated August 2007, as well as conduct of a yearly Contingency Disaster Recovery Plan at an Air Route Traffic Control Center and FISMA Reporting requirements.
- Also appropriated was $700,000 for in-service engineering activities.
- The ECG program must continue to monitor the system to verify that it is providing the benefits, performance, and level of service required. The program was appropriated $800,000 to carry out the analysis prescribed in the ECG Operational Analysis Plan. The OA results are also used to assist the monitoring for the ECG Sustainment and Technology Evolution Plan.

For FY 2010, $3,600,000 is requested for the ECG program to support program objectives in support of the FAA Flight Plan. This funding will provide for the following:

- $1,300,000 for full replacement cost of hardware and software upgrades required to mitigate obsolescence issues. This includes testing of all viable alternatives identified via the STEP process as well as full system testing of the selected alternative. The ECG STEP process has been successful so far in coming up with more cost effective solutions that negate the need for full replacements of ECG components.
- $800,000 for Program Support, that includes support activities for OMB Exhibit 300, Earned Value Management, STEP, Operational Analysis, contract administration, and engineering services. This also includes supporting interfaces with other En Route Automation systems such as NADIN, FDIO, and ERAM.
- $400,000 for ECG Information System Security. This will include remediation activities associated with the completed Security Certification and Authorization Package dated August 2007, as well as conduct of a yearly Contingency Disaster Recovery Plan at an Air Route Traffic Control Center and FISMA Reporting requirements.
- $400,000 to continue Operational Analysis (OA). The OA process ensures that the ECG system is monitored to verify that it is providing the benefits, performance, and level of service required. The OA results are also used to assist the monitoring for the ECG Sustainment and Technology Evolution Plan.
- $700,000 for in-service engineering.

<u>Benefits:</u> The most significant benefits are improved efficiency, capacity, and safety by providing controllers with newer, faster, and more capable technology to manage the significant increase in air traffic. By replacing hardware prior to reaching the end-of-maintenance dates, FAA can avoid significant increases in operation and maintenance costs and delays due to system outages. The future en route automation system will provide a cost-effective and fully integrated platform to support new automation functionality. Supplemental benefits include aviation fuel savings, fewer system delays, and the ability to support the demands of a robust economy. The en route automation system will also accommodate the deployment of functions contained in the initiatives that are expected to provide significant savings to the user community through more fuel efficient routes, reduced flight times and delays, and increases in controller productivity.

In-service engineering allows for immediate response to emerging technology solutions. Funding is needed for ongoing engineering support of all prototyping efforts.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$244,731.2 [1]
FY 2009 Appropriated	---	7,400.0
FY 2010 Request	---	3,600.0
Baseline Requirement	---	64,500.0
Total	Various	$320,231.2

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. ECG Sustainment and Technology Evolution	---	$1,300.0
2. Program Support	---	800.0
3. ECG Information System Security	---	400.0
4. ECG Operational Analysis	---	400.0
5. In-Service Engineering	---	700.0
Total	Various	$3,600.0

[1] Includes reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999 and EAS. Includes reduction for P.L.108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A03	**Next Generation Weather Radar (NEXRAD)**	**$6,900,000**	**Various**	**W-02**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: NEXRAD, a tri-agency program between the Department of Transportation (DOT), the Department of Defense (DOD), and the Department of Commerce's (DOC) National Weather Service (NWS) share developmental costs in proportion to the number of systems fielded by each agency. The NWS is the lead agency responsible for the overall coordination of the development and implementation of the system upgrades. NEXRAD detects, processes, and distributes for display, hazardous and routine weather information on air traffic controller consoles. Technical upgrades are necessary to enhance NEXRAD and provide ATC with weather detection equipment to improve safety by detecting and characterizing hazardous weather phenomena.

In 1979, Congress directed DOT (FAA), DOC (NWS), and DOD to work together and develop a Doppler weather radar system to be shared by all agencies. The tri-agency Memorandum of Agreement (MOA) commits the participating agencies to support, maintain, and enhance the NEXRAD system over the NEXRAD's service life, currently projected to 2025.

The FAA's NEXRAD program provides the means to fund the FAA's share of the overall NEXRAD mission, and to ensure that FAA priorities are included in the planning for NEXRAD sustainment and improvement.

Description of Solution: On-going NEXRAD weather product improvements are critical for replacing the existing infrastructure, and introducing required new capabilities to multiple FAA system interdependent weather systems. The NEXRAD Product Improvement (NPI) updates NEXRAD technology providing two upgrades which include Super Resolution Products, an on-going infrastructure upgrade; and Dual Polarization (DUAL POL), a targeted technology upgrade boosting NEXRAD data quality for better precipitation data used by ITWS, CIWS, WARP, and MIAWS. DUAL POL provides for improved flash flood warnings, severe thunderstorm warnings, biological target identification, and various types of winter storm warnings. Aviation applications include new warnings of hail and icing conditions, turbulence warnings, and bird strike warnings.

During FY 1982 – 2005, $335,004,700 was appropriated for and resulted in the installation of 159 NEXRAD systems, which provide near total countrywide coverage to include; Alaska, Hawaii, and San Juan, PR. Twelve of the 159 NEXRAD systems are owned and operated by the FAA. A portion of these funds, $4,860,800 was appropriated for NEXRAD to complete the development and begin installation of the ORDA system upgrade and continue the development of the Dual Polarization upgrade. In FY 2006 - 2008, $10,049,000 was appropriated to fund FAA's share of the tri-agency agreement to complete the deployment of the RDA upgrade and to proceed from concept exploration to prototype development for the dual polarization upgrade, and to fund software maintenance of tailored aviation algorithms and products.

In FY 2009, $3,000,000 was appropriated to fund software maintenance of tailored aviation algorithms and products. Funds will also be used to complete dual polarization procurement, and to begin development of NEXRAD algorithms that use dual polarization data to detect regions icing aloft. Program office support will continue through the end of FY 2009. This support will assist FAA with the oversight of NEXRAD activities.

For FY 2010, $6,900,000 is requested to continue weather product improvements including funding of software maintenance of tailored aviation algorithms and products as well as Tech Refresh activities. Funding is also provided to initiate Dual POL deployment and continue development of NEXRAD algorithms that use DUAL POL data to detect in-flight icing and hail.

Benefits: NEXRAD systems have increased aviation safety with the accurate and timely detection of hazardous aviation weather conditions. Weather related arrival and departure delays have been reduced, thus allowing aviation fuel consumption savings.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	130	$345,053.7 [1]
FY 2009 Appropriated	---	3,000.0
FY 2010 Request	---	6,900.0
FY 2011-2014	---	14,000.0
Total	130	$368,953.7

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
NEXRAD Product Improvements	---	$6,900.0

[1] Includes $8,700 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999 and EAS. Includes reduction for P.L.108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A04	**Air Traffic Control System Command Center (ATCSCC) Relocation**	**$10,300,000**	**1**	**F-28**

FAA Strategic Goal: Organizational Excellence – Ensure the success of the FAA's mission through stronger leadership, a better trained and safer workforce, enhanced cost-control measures, and improved decision-making based on reliable data. Objective 2 - – Improve financial management while delivering quality customer service.

Description of Problem: The FAA Air Traffic Control System Command Center (ATCSCC) is responsible for the tactical command and control of the National Airspace System (NAS) on a daily basis. The ATCSCC plays a key role in the safe and efficient operation of managing the NAS. The ATCSCC plays a key national security role and in the current leased facility, the security requirements do not continue to meet FAA security standards. Since 1994, the facility has been housed in commercially leased space with the current cost in excess of four million dollars annually. The long term lease is set to expire in May 2011 (previously September 2013). The FAA must have a permanent location for this critical NAS function that continues to meet and stay ahead of evolving FAA security standards. In addition, there are many physical constraints in the existing leased ATCSCC facility operations room for reconfiguration and expansion for new Traffic Flow Management (TFM) equipment deployments. In the past, in order to meet new equipment deployments, the FAA has had to pay significantly for modifications to the existing leased space to accommodate these new TFM equipment deployments.

Description of Solution: For FY 2010, $10,300,000 is requested for equipment and installation costs, project management, construction modifications, site preparation and installation, and FAA Telecommunications Infrastructure (FTI) administrative circuits. The ATCSCC infrastructure planning, relocation and constructs a new ATCSCC facility on the FAA's owned property collocated with the FAA Potomac Consolidated Terminal Radar Approach Control (TRACON) Facility in Warrenton, Virginia. Since the FAA owns the 33 acres of property where the Potomac TRACON is located, no new land acquisition will be required to build this new ATCSCC facility.

The existing ATCSCC is in a leased facility (located in Herndon, VA) that does not meet evolving FAA security standards. The new facility is moving to a secure FAA site that meets all existing FAA security requirements. In fact, the Potomac TRACON site is one of the few FAA sites that have received full Security Accreditation.

In addition to reducing the FAA costs to operate the ATCSCC, the new facility is being designed to overcome the constraints of the existing building. Over the years the Traffic Flow Management equipment has been going through a relatively constant change with new equipment arriving nearly every year. The existing control room and the consoles were not designed with reconfigurations in mind. As a result, the FAA continues to incur a significant cost for each minor reconfiguration or each new tool being deployed. The new facility is being designed from the ground up with the ability to reconfigure at little or no cost as a primary objective. This flexibility will not only allow low cost adaptability, it will also allow for much quicker deployment of equipment.

Benefits: The ATCSCC relocation will lower FAA's life cycle costs. The FAA will achieve cost avoidance benefits projected at $121.4 million from fiscal year 2010 through fiscal year 2031. Collocation will also lower capital costs by eliminating the need for land acquisition, reducing site work costs, and significantly reducing backup power system and utility costs. Operations and Maintenance (O&M) costs will be reduced as well for the ATC system maintenance, facility security, telecommunication services, and grounds maintenance through collocation.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$2,500.0
FY 2009 Appropriated	---	28,600.0
FY 2010 Request	---	10,300.0
FY 2011-2014	---	4,200.0
Total	Various	$45,600.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Equipment and Installation	---	$1,500.0
2. Program Management	---	540.0
3. Procurement and Installation	---	1,900.0
4. Construction Modification	---	1,000.0
5. Site Preparation and Installation	---	4,700.0
6. FTI and Administrative Circuits	---	660.0
Total	1	$10,300.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A05	**ARTCC Building Improvements/ Plant Improvements**	**$51,300,000**	**Various**	**F-06**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: En Route and Oceanic Services are responsible for sustaining and modernizing the FAA's 21 Air Route Traffic Control Centers (ARTCCs) as well as the Combined Center Radar Approach Control (CERAP) facilities at San Juan and Guam. The ARTCC Plan Modernization program is necessary to support Air Traffic Control (ATC) operational requirements and reduce the risk of ATC delays caused by infrastructure failures and to minimize future costs associated with infrastructure failures. These facilities and much of the mechanical and electrical equipment within them are over 40 years old. Many of the systems are beyond their life expectancies and at risk of failure. For example, in June 2001 smoke from a kitchen fire at the Cleveland ARTCC required an evacuation of the control room resulting in the loss of ATC capability for 16 minutes over 65,000 square miles. Fifty flights were delayed and all en route traffic was routed around the Cleveland airspace. In FY 2005 alone, there were eight catastrophic occurrences of pipe ruptures which could have similarly affected operations. At the Washington ARTCC, plastic sheeting had to be draped over air traffic control positions to continue operations.

The presence of asbestos fireproofing continues to pose a risk to maintenance personnel and significantly increases costs associated with maintenance or repair activities. Fire protection systems must be added in some areas of the buildings to meet building codes and structural upgrades are necessary at ARTCCs in seismic areas.

In FY 2006, a condition assessment survey identified a $121 million backlog of facility equipment that is past its life cycle. Obsolete equipment in this backlog increases facility operations risk in the event of failure. Additionally, when this equipment fails, the FAA often must expend additional funding to repair affected areas. For example when a roof or pipe leaks, repairs must be made to walls, ceilings and carpets. The facility industry estimates that building owners incur $4 of out year liability for each $1 of backlog. The current backlog represents a potential outyear capital liability of $484 million.

Description of Solution: In FY 2009, $50,000,000 was appropriated under the American Recovery and Reinvestment Act (ARRA) for the following:

- Parking lots repair projects at Denver, Fort Worth, Minneapolis, and Memphis ARTCC.
- Roof replacement project at Minneapolis ARTCC.
- Building automation control replacement at Anchorage ARTCC.
- Curtain Wall and Elevator Replacement projects at Jacksonville, Albuquerque, Indianapolis, Minneapolis, Chicago, Fort Worth, Denver, Leesburg, and Boston ARTCC.
- Curtain Wall only replacement projects at Salt Lake City, Cleveland, Seattle, Los Angeles, Oakland, and Anchorage ARTCC.
- Elevator only replacement projects at Kansas City, New York, and Memphis.
- Control Wing Basement, Chillers, and Cooling Tower Replacement project at Minneapolis ARTCC.

For FY 2010, $50,000,000 is requested to continue ARTCC modernization and sustainment projects. Major construction projects will replace obsolete support equipment in operations, equipment and training areas. These projects will include asbestos abatement, mechanical/electrical system replacements, fire detection and protection upgrades as well as interior architectural construction. All facilities will also receive smaller sustain projects targeted at eliminating infrastructure failure modes by replacing mission critical components. An additional $1,300,000 is requested for in-service engineering.

Benefits: To support the FAA's Greater Capacity goal, the FAA must cost effectively renovate and manage its En Route facilities. This program is linked to a Flight Plan performance target for sustaining the operational availability of facilities that support the 35 OEP airports as well as the Air Traffic Operations organizational goals for optimizing service availability and reducing the unit costs of operations. These projects will reduce the risk of facility outages and will upgrade the facilities to meet current building code requirements. They will modernize En Route facilities to provide an efficient, reliable, and safe work environment. The effective service life of En Route facilities will be extended through these projects. The FAA will eliminate approximately $19 million of existing backlog and will avoid a projected $76 million of potential emergency repair costs.

In-service engineering allows for immediate response to emerging technology solutions. Funding is needed for ongoing engineering support of all prototyping efforts.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$935,600.0 [1]
FY 2009 Appropriated	---	56,500.0
FY 2009 American Recovery and Reinvestment Act	---	50,000.0
FY 2010 Request	---	51,300.0
FY 2011-2014	---	243,800.0 [2]
Total	Various	$1,337,200.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. ARTCC Facility Modernization	---	$50,000.0
2. In-Service Engineering	---	1,300.0
Total	Various	$51,300.0

[1] Includes $19,600,000 in prior year funds for the San Juan CERAP – Sustain program. Includes $23,800 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. Includes $1,179,900 reduction of FY 2002 funds pursuant to supplemental P.L. 107-206, January 23, 2002. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.
[2] Future requirements will be based on activity levels and local situations that are validated on a year-to-year basis.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A06	**Air Traffic Management (ATM)**	**$31,400,000**	**Various**	**A-05, A-21, M-08, M-39**

FAA Strategic Goals: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 2 - Increase reliability and on-time performance of scheduled carriers.

Description of Problem: Flight operations are approaching pre-9/11 levels, and aviation trends indicate that air traffic demand will continue to increase. Domestic, regional and commuter patterns and compositions are changing. Despite this growth, the economic viability of many commercial carrier airlines is uncertain. The Traffic Flow Management (TFM) portfolio of tools and capabilities is the only part of the national airspace system designed to help the aviation community reduce delays, improve operations, and succeed economically. However, the system cannot accommodate the anticipated growth in demand for services.

The existing TFM toolset will need to overcome the following challenges to meet the FAA's mission and customer expectations:

- Continued timely development and integration of sophisticated decision support tools to minimize NAS delays and improve efficiency.
- Obsolescence of existing TFM system software architecture.
- Near-term sustainment limitations of existing TFM Infrastructure (TFM-I).
- Fiscal pressures forcing a reduction in the cost of ownership.

1. Air Traffic Management (ATM) - TFM Infrastructure - Infrastructure Modernization ($7,400,000):

Description of Solution: The FAA must maintain mission essential operations at its 81 TFM-equipped ATC facilities for its customers and continue to provide enhanced TFM services. Air Traffic Management (ATM) includes: modernization of the Traffic Flow Management Infrastructure (TFM-I), development of Collaborative Air Traffic Management Technologies (CATMT), technology refreshment of the Departure Spacing Program (DSP), and development of the Route Availability Planning Tool (RAPT) prototype, and provides direct mission support to the FAA by ensuring efficient flow of air traffic through the NAS.

TFM is the nation's primary source for disseminating flight information across the aviation community. The automation and communication mechanisms provided by the TFM system support the decision-making process used to adjust flight schedules and/or routes as necessary. When the NAS is impacted by severe weather, congestion, and/or outages, the TFM system has unique capabilities to predict chokepoints and facilitate the collaboration and execution of mitigation initiatives with stakeholders, using common information displays and tools, to minimize NAS delays.

Traffic Flow Management Infrastructure Modernization (TFM-M): The TFM-M program has recently replaced the obsolete hardware at FAA's field ATC facilities and in the process of modernizing the hub site facility hardware and software of the current infrastructure. When completed, TFM-M will provide a hardware and software infrastructure that will enable continued development of products and services to more effectively manage the flow of air traffic, while reducing the cost of ownership and ensuring the technological capacity to meet future user and customer needs.

In FY 2005, funding was appropriated for continuation of TFM-M design activities and for one functional upgrade at TFM-I field facilities, Hub operations, and lab facilities. Additionally, the evaluation of DSP multi-center system feasibility was discontinued, and the DSP Integration and Operations Lab was decommissioned at the William J. Hughes Technical Center. DSP field sites have initiated transition to operational sustainment. All DSP operational sites will continue to transition to operational sustainment. In FY 2005, TFM-M completed hardware replacement of existing obsolete TFM-I equipment ahead of schedule. This will reduce capital costs by 50 percent. TFM-M also completed system design of the modernized architecture. In FY 2006, $44,600,000 was appropriated for TFM-M to begin full-scale development-of the new system architecture.

In FY 2007, $43,800,000 was appropriated for TFM-M to continue software development of the modernized system architecture.

In FY 2008, $53,500,000 was appropriated to complete the deployment of the TFM Processing Center (TPC) (relocated hub site at WJH Technical Center), complete the release 3 software development (final operating software upgrade), and fund the continued development of TFM-M hardware and software miscellaneous enhancements.

In FY 2009, $40,800,000 was appropriated to fund the test and deployment of the final operating software upgrade and to provide for continued development of TFM-M hardware and software enhancements.

For FY 2010, $7,400,000 is requested to begin the technology refresh of the TFM remote sites.

Benefits: TFM-M allows new tools and additional collaborative ATM functionality to be expanded and integrated into the existing infrastructure to improve system efficiency and decrease air traffic delays. Reduced delays produce substantial economic benefits to air carriers at a time when they are trying to recover financially. Independent economic analyses show that TFM programs currently deliver $350 - $550 million in benefits per year to FAA customers. TFM-M and CATMT are estimated to deliver at least $155 million in annual benefits to FAA customers when the initial software functions are deployed, and will also reduce the FAA's cost of ownership for TFM-I by lowering sustainment costs. The Post Implementation Review (PIR) performed on the AFP deployment in ETMS v8.2 showed that AFP saved the aviation community approximately $38M from June 2006 - December 2006. The PIR performed on ETMS v8.3 showed that Adaptive Compression was saving at a $22M/yr rate. The PIRs performed on ETMS v8.4 and v8.5 documented a more usable system, but did not quantify cost savings.

2. Collaborative Air Traffic Management Technologies Work Package 1 ($22,200,000):

Description of Solution: The FAA must maintain mission essential operations at all 81 TFM-equipped ATC facilities for its customers and continue to provide enhanced TFM services. Air Traffic Management (ATM) includes: modernization of the Traffic Flow Management Infrastructure (TFM-I), development of Collaborative Air Traffic Management Technologies (CATMT), technology refreshment of the Departure Spacing Program (DSP), and development of the Route Availability Planning Tool (RAPT) prototype, and provides direct mission support to the FAA by ensuring efficient flow of air traffic through the NAS.

Collaborative Air Traffic Management Technologies (CATMT): CATMT Work Package 1 focuses on four areas: Airspace Flow Management, Impact Assessment and Resolution, Domain Integration, and Performance Management. These capabilities will improve the usage of existing NAS capacity by improving automation tools and procedures to make air traffic more efficient during periods of adverse weather or excessive volume. Additionally, it will promote the use of automated systems that provide more accurate and timely information to all users and customers, and will implement tools and processes that promote collaborative decisions regarding best routing and scheduling alternatives.

In FY 2006, $27,300,000 was appropriated to initiate related CATMT software development activities. Funding was also used to develop functional software upgrades, including the Airspace Flow Program, for existing TFM facilities, including 81 FAA facilities and 41 non-FAA facilities.

In FY 2007, $32,900,000 was appropriated for the CATMT program to provide incrementally developed and integrated decision support capabilities into the legacy TFM-I, while in consideration of TFM-M interdependencies.

In FY 2008, $34,800,000 was appropriated to fund the continued enhancements of CATMT Work Package 1, specifically the initial Flight Schedule Monitor cross impact modeling (phase 1) capability. This will allow a limited initial capability to examine the impacts of both the Airspace Flow Program (ASP) and the Ground Delay Program (GDP) while preparing a planning traffic management initiative. Additionally, CATMT will add 2-3 more airport surface data sources for selected new airports into the surface database used for TFM.

In FY 2009, $34,100,000 was appropriated to fund the continued enhancements of CATMT Work Package 1, specifically the enhanced Flight Schedule Monitor cross impact modeling capability (phase 2). This will allow an enhanced analysis capability to examine the impacts of both the Airspace Flow Program (ASP) and the Ground Delay Program (GDP) while preparing a planning traffic management initiative. Additionally, CATMT will add another 2-3 more airport surface data sources for selected new airports into the surface database used for TFM.

For FY 2010, $22,200,000 is requested to complete the CATMT Work Package 1 enhancements, specifically the reroute impact assessment capability which allows TMU personnel to examine the impact of reroute requests on planned traffic management initiatives before actually activating them.

Benefits: TFM-M allows new tools and additional collaborative ATM functionality to be expanded and integrated into the existing infrastructure to improve system efficiency and decrease air traffic delays. Reduced delays produce substantial economic benefits to air carriers at a time when they are trying to recover financially. Independent economic analyses show that TFM programs currently deliver $350-$550 million in benefits per year to FAA customers. TFM-M and CATMT are estimated to deliver at least $155 million in annual benefits to FAA customers when the initial software functions are deployed, and will also reduce the FAA's cost of ownership for TFM-I by lowering sustainment costs. The PIR performed on the AFP deployment in ETMS v8.2 showed that AFP saved the aviation community approximately $38M from June 2006 - December 2006. The PIR performed on ETMS 8.3 showed that Adaptive Compression was saving at a $22M/yr rate. The PIRs performed on ETMS v8.4 and v8.5 documented a more usable system, but did not quantify cost savings.

3. Route Availability Planning Tool (RAPT) ($1,000,000):

Description of Solution: The FAA must maintain mission essential operations at its 81 TFM-equipped ATC facilities for its customers and continue to upgrade enhanced TFM services. Air Traffic Management (ATM) includes: modernization of the Traffic Flow Management Infrastructure (TFM-I), development of Collaborative Air Traffic Management Technologies (CATMT), technology refreshment of the Departure Spacing Program (DSP), and development of the Route Availability Planning Tool (RAPT) prototype, and provides direct mission support to the FAA by ensuring efficient flow of air traffic through the NAS.

TFM is the nation's primary source for disseminating flight information across the aviation community. The automation and communication mechanisms provided by the TFM system support the decision-making process used to adjust flight schedules and/or routes as necessary. When the NAS is impacted by severe weather, congestion, and/or outages, the TFM system has unique capabilities to predict chokepoints and facilitate the collaboration and execution of mitigation initiatives with stakeholders, using common information displays and tools, to minimize NAS delays.

The RAPT is currently in operation as a prototype in the New York area and requires support for continued operation, evaluation, development and expansion of the demonstration system. RAPT combines state-of-the-art weather forecasts with operational flight data to help FAA traffic managers and airlines determine if future departures will encounter hazardous weather at some point along their intended path, and to determine if opportunities exist to route aircraft through safer skies.

In FY 2007, $1,000,000 was appropriated for RAPT to support the existing operation, begin evaluation of the demonstration system, and extend RAPT to another major terminal. In FY 2008, $1,600,000 was appropriated to fund the prototype efforts for RAPT. In FY 2009, $1,600,000 was appropriated to fund the prototype efforts for RAPT.

For FY 2010, $1,000,000 is requested to fund the continued evaluation of the RAPT prototype.

Benefits: A RAPT operational use assessment was conducted in 2007 by MITLL and FAA Aviation Weather Office observers at 11 FAA and airline dispatch facilities during 11 convective weather SWAP impact events. The assessment covered simultaneous real-time documentation of RAPT operational usage and technical performance. Eleven unique RAPT benefits categories were identified during the assessment. Observed RAPT applications included quantifiable departure capacity enhancement benefits [e.g., more timely reopening of departure routes (RO)] and improved collaborative decision-making applications such as increased awareness of departure route impacts caused by weather. The frequency of each type of RAPT application was tabulated for each FAA and airline facility and rolled-up to an annual RAPT benefits frequency estimate based upon the historical average number of NY SWAP days per year.

Several RAPT benefits case studies were analyzed in an effort to quantify the delay savings associated with the four primary RAPT departure flow management benefit categories. Results show per use RAPT benefits ranged from 0.9 to 26.7 hours of delay saved, with per use cost savings ranging from $2,900 to $85,000. The large variation in case-to-case delay savings was not surprising given that NY departure delays arise from highly nonlinear queues.

Mean or median (where possible) case study delay savings per benefit category were multiplied by the estimated annual frequency of the various RAPT operational uses to determine the annual 2007 RAPT delay reduction benefits. Annual RAPT benefits in 2007 totaled 2,300 hours of delay saved, with a cost savings of $7.5 million.

As the operational user experience with RAPT increases and identified operational deficiencies are addressed, estimated annual near-term "potential" New York RAPT benefits were estimated at 8,800 hours of delay savings with associated cost savings of $28 million.

4. Air Traffic Management - In-Service Engineering ($800,000):

Also requested in FY 2010 is $800,000 for in-service engineering to allow for immediate response to emerging technology solutions. Funding is requested for ongoing engineering support of all prototyping efforts.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	Various	$918,835.8 [1]
FY 2009 Appropriated	---	90,200.0
FY 2010 Request	---	31,400.0
Baseline Requirement	---	45,200.0
Total	Various	$1,085,635.8

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. TFM-I Modernization	---	$7,400.0
2. Collaborative Air Traffic Management Technologies WP1	---	22,200.0
3. Route Availability Planning Tool	---	1,000.0
4. In Service Engineering	---	800.0
Total	Various	$31,400.0

[1] Includes a $57,077 reduction of FY 2001 funds pursuant to rescission contained under P.L. 106-544. Includes a reduction for EAS in FY 2002. Includes a reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004. Includes $17,700,000 for Free Flight Phase 2/CDM program to continue functionality development under new program, Collaborative Air Traffic Management Technologies.
[2] Future requirement does not include Initial estimate of $100.0M for CATMT Work Package 2 effort which will go to the FAA JRC at the end of FY 2008.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A07	**Air/Ground Communications Infrastructure**	**$8,600,000**	**Various**	**C-04, C-06, M-08**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The current air/ground communication system must be improved to support FAA's goal to provide increased capacity in the U.S. airspace system that reduces congestion and meets projected demand. The growth in air traffic operational requirements has increased the need for air/ground communications coverage. The current system is aging, increasingly unreliable, and susceptible to radio interference. Disruptions of air/ground controllers to communicate with aircraft around affected areas and may remove the ability of ground controllers to communicate with aircraft. Radio frequency interference at an Air/Ground (A/G) facility would severely disrupt air traffic services. Due to the deferment of the next generation air/ground communications (NEXCOM) system development program, FAA must continue to support the radio control equipment requirement to support expanded communications coverage.

Description of Solution: Air/Ground Communications Infrastructure will replace aging and increasingly unreliable equipment. In addition, Air/Ground Communications Infrastructure will establish new communications facilities. For FY 2010, $8,600,000 is requested to fund the Air/Ground Communications Infrastructure as follows:

- The Communications Facilities Expansion (CFE) program provides new communications facilities and equipment. The program also improves and/or relocates current communication facilities to meet new demands. For FY 2010, $5,000,000 is requested to provide funding for 12 expansion/relocation sites, procure replacement radios, equipment racks, antennas, towers, and site preparation/installation material.
- The Radio Control Equipment (RCE) program replaces radio signaling and tone control equipment. The equipment is located at all air route traffic control centers, remote center air/ground communications facilities, air traffic control facilities, remote transmitter receiver sites, flight service stations and remote control outlets. For FY 2010, $3,000,000 is requested to install 240 RCE units, complete investment analysis and award a new RCE contract.

Also requested is $600,000 for in-service engineering. This allows for immediate response to emerging technology solution. Funding is needed for on-going engineering support of all prototyping efforts.

Benefits: The Air/Ground Communications Infrastructure program supports the FAA goal of Reduced Congestion. New and relocated communication facilities enable the establishment of new sectors to support capacity. In addition, new and relocated communication facilities will enable new and more efficient flight patterns. Efficient flight patterns reduce aircraft operations and maintenance costs for the airline industry. New communication equipment will lower periodic and correctional maintenance costs associated with the old and technically obsolete equipment in the field.

The RCE program provides significant benefits to the FAA. The current RCE equipment will be maintained until 2015. There exists some uncertainty as to what systems will be deployed between 2015 – 2025, however, by funding a new RCE acquisition effort in FY 2010 the FAA will help to quantify these uncertainties through an RCE investment analysis and acquisition. According to the February 2006 A/G Communications Roadmap, and its subsequent updates, the current RCE infrastructure is required until 2025. The benefit of the new RCE product is to provide a tech-refresh to bridge the gap between 2015 - 2025 and beyond, leading to a more capable infrastructure.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$449,121.5 [1]
FY 2009 Appropriated	---	7,500.0
FY 2010 Request	---	8,600.0
FY 2011-2014	---	9,300.0 [2]
Total	Various	$474,521.5

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Communications Facilites Enhancements	---	$5,000.0
2. Radio Control Equipment	---	3,000.0
3. In-Service Engineering	---	600.0
Total	Various	$8,600.0

[1] UHF Radio Replacement Funding history transferred to BLI 2A17. Includes $584,600 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. Also includes $3,200,000 reduction for FY 1998 Congressional reprogramming. Includes $5,453,300 reduction of the FY 2002 funds pursuant to supplemental P.L.107-206, January 23, 2002. Includes $3,000,000 reduction for FY2003 Congressional reprogramming. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

[2] Future requirements depend on NEXCOM Segments 2 and 3 Investment Analysis.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A08	**ATC Beacon Interrogator (ATCBI) – Replacement**	**$4,700,000**	**Various**	**S-02**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meet projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The Air Traffic Control Beacon Interrogator Replacement (ATCBI-6) is secondary radar used for En Route and Oceanic air traffic control. The ATCBI-6 provides aircraft position information and identification to Air Traffic Control facilities, for separation assurance, and traffic management. The ATCBI-6, in conjunction with co-located primary long-range radar, also provides back-up radar approach surveillance service to numerous Terminal Radar Approach Control (TRACON) facilities in the case of lost terminal radar services or scheduled maintenance downtime. The ATCBI-6 system is a low-cost, highly reliable, very accurate, and more capable replacement for the older, higher cost, and less reliable beacon interrogators (ATCBI-4/5).

The FAA's existing En Route surveillance ATCBI-4/5 systems have reached the end of their projected life-cycles and many of the parts are already obsolete. The inability to replenish spares is putting the availability of En Route secondary surveillance service at risk. Furthermore, the existing beacons are analog systems that are incompatible with new automation systems such as STARS and ERAM, the plan HOST Replacement. In addition, the antiquated technology of the ATCBI-4/5 systems does not provide the quality of performance that today's technology can provide. The processors supporting these beacons use a crude estimation technique for azimuth detection known as "sliding window" that calculates the aircraft azimuth by averaging the leading and trailing edge replies from the stream of responses from the aircraft. This is an imprecise estimation technique and if the stream of replies is interrupted (i.e., replies are missing), the system provides inaccurate or false reports. ATCBI-6 utilizes monopulse direction finding techniques for increased accuracy. The current ATCBI-4/5s also have a high susceptibility to interference and synchronous garble as well as a limited number of aircraft beacon codes.

The FAA utilizes surveillance coverage from 12 of the 15 current DoD AN/FPS-117 primary radars with attached OX-60 secondary (beacon) radars in Alaska, to support the FAA air traffic control mission. These facilities are referred to as Alaskan Minimally Attended Radar (MAR) radars. The OX-60 beacon radars were procured in the 1970's. DoD has been reporting an extended repair cycle due to parts obsolescence. The LSI-2000 will replace the aging OX-60 secondary beacon radars in Alaska. The FAA is assisting the USAF in expediting the replacement of the secondary surveillance systems at the Joint Use Radar Facilities in Alaska to improve the quality, reliability, and availability of radar data used for Air Traffic Control in the region.

Description of Solution: ATCBI-6 is part of the agency's continuing effort to upgrade equipment to provide greater system capability and reliability that will reduce operating costs. The ATCBI-6 replacement program will replace existing En Route ATCBI-4/5 equipment and establish new beacon-only sites. The ATCBI-6 program will upgrade the current beacons to sustain NAS safety and efficiency and to avoid incurring unmanageable maintenance and supportability costs. This approach will meet the near-term needs while providing for a seamless transition for FAA use of GPS-based technology. The original ATCBI-6 replacement program included one ATCBI-6 prototype and 127 ATCBI-6 systems to replace existing operational beacons; support systems for training, testing, logistics, and operational support; and provide systems for three new sites. An additional nine ATCBI-6 systems were added, due to Congressional establishments, agency cost share agreements, other government projects, and the need for additional support systems, for a total of 137 systems.

During FY 1998-2008, the replacement program awarded a contract to Raytheon in August 1998. The program office procured one prototype and 136 ATCBI-6 systems and spares and completed all deliveries from Raytheon to FAA. The program also conducted site surveys; completed interface development and test requirements for the General Purpose Interface Bus (GPIB), Monopulse Beacon Test Set (MBTS), ARSR-3, and

Mode 4/ARSR-4; procured all Monopulse Beacon Test Sets (MBTS); purchased and installed rotary joints and antennas; developed and procured Occupational Safety and Health Administration (OSHA) ladders; completed the 3 year update of the Security Certification and Authorization Process (SCAP); conducted maintenance and operational training; continued depot and software maintenance; delivered 135 systems to sites and support facilities; accepted 133 systems at sites and support facilities; commissioned 108 systems; began rotary joint modification; completed infrastructure efforts at Grand Turk, TC and Pico Del Este, PR; continued transitioning depot level support services from Raytheon to the FAA Logistics Center in Oklahoma City, OK; and initiated investigation of potential changes to support NEXTGEN automation interface. In the fourth quarter of FY 2008 the agency entered into two cost share agreements with Provo, UT and Santa Fe, NM to establish two new beacon only sites. The OX-60 Program acquired LSI-2000 beacons, including non-recurring engineering and developmental work, for the 12 MAR sites in Alaska that interface with the Anchorage, AK Micro EARTS.

The Beacon Only Facility Establishment Program completed construction, system installation and commissioning activities at the two cost share agreement sites, Eagle County, CO and Gallatin Field, MT, and the congressional mandate site Redmond, OR; completed construction and system installation at the congressional mandate site, Jackson Hole, WY; completed commissioning activities at Georgetown, BH; and initiated site construction activities at Freeport, BH and Yakutat, AK.

In FY 2009, $13,000,000 was appropriated, of which $10,000,000 was for ATCBI-6 replacement activities and $3,000,000 was for Beacon Only Facility Establishment activities. The ATCBI-6 replacement program will support the delivery of the two remaining ATCBI-6 systems to sites and the acquisition of two ATCBI-6 systems for Santa Fe, NM and Provo, UT cost share sites. The FAA plans to have the following 17 ATCBI-6 systems in initial operating capability: 1) Empire, MI; 2) Mt. Kaala, HI; 3) Salem, OR; 4) Nashwauk, MN; 5) Fremont Valley, Edwards AFB, CA; 6) Mica Peak, WA; 7) San Antonio, TX; 8) Rainbow Ridge, CA; 9) Whitehouse, FL; 10) Bootlegger Ridge, MT; 11) Morales, TX; 12) Cross City, FL; 13) Mt. Laguna, CA; 14) Guantanamo Bay, CU; 15) Pico Del Este, PR; 16) San Clemente Island, CA; and 17) Grand Turk, TC. The program office will also use funds to continue optimization and 2nd level engineering support; conduct additional maintenance training courses; continue Rotary Joint Modification and installation; start close out activities on prime contract; and complete the three year update of the Security Certification and Authorization Process (SCAP) for the period of 2007 through 2009. The Beacon Only Facility Establishment funding of $3,000,000 was appropriated to complete construction activities at Yakutat, AK.

For FY 2010, $4,700,000 is requested to complete acquisition and deployment activities for the program. FY 2010 funds will complete construction, installation and commissioning activities at cost share sites, Provo, UT and Santa Fe, NM; complete commissioning activities at all other remaining sites including the Beacon Only Facility Sites; complete disposal of ATCBI-4/5 systems; complete Rotary Joint installations; complete the 3 year update of the SCAP for the period of 2010 through 2012, and complete the transition of the program to steady state in 2012.

Benefits: As the ATCBI-6 systems are deployed, FAA will realize significant cost savings due to reduced maintenance. The ATCBI-6 will also provide the agency with the capability to sustain NAS safety and efficiency at both terminal and En Route radar locations by avoiding secondary surveillance service outages that occur as the availability of the ATCBI-4/5s decrease due to insufficient spare parts. Additionally, the enhanced performance of the modern ATCBI-6 technology should increase controller productivity.

APPROPRIATION SUMMARY

	ATCBI-6	OX-60	Amount ($000)
Appropriated (FY 1982-2008)	136	12	$282,613.9 [1]
FY 2009 Appropriated	---	---	13,000.0
FY 2010 Request	---	---	4,700.0
FY 2011-2014	---	---	0.0
Total	136	12	$300,313.9

[1] Includes reductions pursuant to P.L.108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Prime Contract	---	$600.0
2. Contract Support	---	712.0
3. SCAP update	---	106.0
4. Construction (Provo/Santa Fe)	---	1,195.0
5. Site Prep/Flight Check/Schedule A&B Items	---	180.7
6. Optimization Support/2nd Level Engineering	---	335.0
7. Depot Level Support	---	108.0
8. Rotary Modification	---	1,463.3
Total	Various	$4,700.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A09	**Air Traffic Control En Route Radar Facilities Improvements**	**$5,300,000**	**Various**	**S-04, M-08**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The National Airspace System (NAS) currently has 142 En Route surveillance facilities. All of these facilities contain critical long-range secondary beacon radars. Many of these En Route (long range radar) sites were established in the early 1950's. Today, FAA air traffic control (ATC) requires seamless surveillance information provided within each air traffic controller's area of responsibility. In order to reliably provide seamless surveillance information in the En Route environment and due to the extreme age of these facilities, the need for facility infrastructure improvements are required at all of the operational En Route surveillance facilities. Failures and deficiencies in the existing infrastructure resulted in operational outages each year that have severe and immediate impacts on air traffic control En Route services.

The current air surveillance infrastructure has shortfalls that must be addressed to ensure that the air surveillance system can continue to meet the user needs into the future. The immediate need is to ensure that current air surveillance capabilities do not further degrade while planning and implementing longer-term solutions.

Most En Route surveillance facilities require improvements and/or modifications to correct existing deficiencies. Approximately 40 percent of the En Route surveillance service outages currently experienced can be directly linked to infrastructure failures and deficiencies.

Long Range Radar (LRR) Infrastructure Upgrades consist of two phases. Phase I consists of short term upgrades to facility infrastructure (i.e. refurbishment of lightning, grounding, bonding, and shielding systems) necessary to support the ATCBI-6 deployment; and, Phase II consists of long term upgrades, replacement, and refurbishment of facility infrastructure subsystems. These upgrades will replace critical infrastructure systems if required for En Route secondary beacon operations.

Description of Solution: Prior to FY 2006, funds supported Phase I ATCBI-6 infrastructure upgrades; the removal of surplus radar equipment and towers; En Route radar facility improvements including random replacements; ATC radar beacon system relocations; Alaskan upgrades; and engineering solutions for urgent, site specific, operational, En Route radar facility issues. Congress provided limited funding in FY 2003 to address some of the ARSR-4 technical deficiencies. In FY 2004 and FY 2005 congress provided a pilot program for ARSR-4 electronic technical manual. In FY 2006, FAA will complete the Phase I infrastructure upgrades at 106 scheduled ATCBI-6 sites. Infrastructure upgrades include refurbishing power panels; improving lightning protection and grounding systems; replacing equipment shelters, and building improvements where necessary at beacon only sites.

In FY 2007, $5,000,000 was appropriated to support activities for the primary En Route radars funded by DoD and Department of Homeland Security (DHS) reimbursable agreement. Funding supported the facility grounding upgrades at approximately 10 sites, the completion of 66 facilities assessments, continuation of system rotary joint/azimuth pulse generator and critical infrastructure upgrades and refurbishments required in order to sustain En Route secondary beacon radar operations for an additional 20 years.

In FY 2008, $5,000,000 was appropriated for the continuation of facility improvement activities including: improving lightning protection and grounding systems, system rotary joint/azimuth pulse generator, critical infrastructure upgrades and refurbishments required in order to sustain En Route secondary beacon radar operations for an additional 20 years. An additional $300,000 was appropriated for in service engineering activities.

In FY 2009, $5,000,000 was appropriated to continue facility improvement activities including: improving lightning protection and grounding systems, system rotary joint/azimuth pulse generator, critical infrastructure upgrades and refurbishments required in order to sustain En Route secondary beacon radar operations for an additional 20 years. An additional $300,000 was appropriated for in service engineering activities. DoD/DHS assumed shared financial responsibility for En Route primary surveillance radars. DoD/DHS is responsible for the cost of maintaining and upgrading the primary surveillance radars.

For FY 2010, $5,000,000 is requested to continue facility infrastructure upgrades at both ARSR-4 and LRR Service Life Extension Programs at 19 sites. In coordination with support activities for the primary En Route radars funded by DoD and DHS reimbursable agreement, funding will support the repair and maintenance of the aging en route radar towers and facility grounding upgrades, and critical infrastructure upgrades and refurbishments required to sustain En Route secondary beacon radar operations for an additional 20 years. An additional $300,000 is requested for in service engineering activities.

Benefits: The planned infrastructure modifications will provide greater efficiency and reduce operating costs in En Route air traffic control and facility maintenance operations by refurbishing En Route equipment and facilities. Prior year accomplishments reduced the potential for reduced coverage. The lightning protection, grounding, bonding, and shielding has reduced failure occurrences in the beacon surveillance sites.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	109	$191,657.3 [1]
FY 2009 Appropriated	19	5,300.0
FY 2010 Request	19	5,300.0
FY 2011-2014	29	18,200.0 [2]
Total	176	$220,457.3

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Infrastructure Upgrades	---	$5,000.0
2. In Service Engineering	---	300.0
Total	Various	$5,300.0

[1] Includes $314,500 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999.
[2] An investment analysis is currently underway aimed at defining a program to extend the life of the infrastructure at all LLR sites. The goal would be a consolidated plan to match the life of the site infrastructure with that of the surveillance systems at those sites. The FAA and DoD funding responsibilities will be addressed as part of the recommended solution.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A10	**Voice Switching and Control System (VSCS) Tech Refresh - Phase 2**	$16,700,000	Various	C-01, M-08

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The VSCS system allows air traffic controllers to talk to pilots, providing air-to-ground and ground-to-ground voice switching and control systems at the 21 high-altitude centers, the Mike Monroney Aeronautical Center, and the William J. Hughes Technical Center. Without this system, controllers would be unable to speak with pilots and ground personnel to separate air traffic. VSCS is a critical piece of today's air traffic infrastructure. This system was fielded between 1994 and 1997. VSCS Training and Backup System (VTABS), which provides training circuits, separate from the operational communications, functions as the backup communications system.

This existing high-altitude voice switching and control system architecture is based on a 1970's design. Critical hardware and software are reaching the end of their useful service lives. Obsolete parts and programming languages have made maintenance cumbersome and costly. The FAA must replace the obsolete hardware and software now to avoid diminishing service reliability and increasing maintenance costs.

Description of Solution: This tech refresh replaces obsolete hardware and software for all the high-altitude voice switching and control systems, and those at the Mike Monroney Aeronautical Center and the William J. Hughes Technical Center. Phase 1 of the equipment upgrade began in 2000 and ended in 2006. Continued technical refreshment will allow the system to remain in use beyond 2014, which gives FAA plenty of time to develop the next generation voice switch.

In FY 2007, $15,000,000 was appropriated to fund completion of Work Station Upgrade (WSU) installations, begin deployment of video display monitor replacements (VDMR), continue power supply refurbishment, start engineering for VTABS power supply replacement, an internal local area network (LAN) upgrade, and test equipment replacement; begin some code conversion activities and conduct an engineering study for system node replacement. An additional $1,900,000 was appropriated for the Business Continuity Plan (BCP). In FY 2008, $15,000,000 was appropriated to fund the retrofit of VSCS Power Supplies, the remainder of video display monitor replacement (VDMR) installation activities, continuing code conversion, test equipment development, engineering efforts for ground-to-ground switch replacement, and to conduct studies about future phases of technology refresh for VSCS. Also, $200,000 was appropriated for Independent Operational Test and Evaluation (IOT&E) and $500,000 for in-service engineering activities. In FY 2009, $22,800,000 was appropriated to continue the retrofit of VSCS power supplies, the development of depot test equipment of repeater/LAN efforts, PLM to C++ code conversion activities, and engineering analysis. An additional $500,000 was appropriated for in-service engineering activities.

For FY 2010, $16,100,000 is requested to continue the retrofit of VSCS power supplies, the development of depot test equipment of repeater/LAN efforts, PLM to C++ code conversion activities, engineering analysis, and development of a replacement for the VTABS Test Controller. An additional $600,000 is requested for in-service engineering.

Benefits: VSCS is an integral part of a functional En route air traffic control system; it provides the following qualitative benefits: Reliable access to many different ATC radios; Ability for ATC personnel to communicate with each other and coordinate work in the ARTCCs; and Reliable and maintainable voice communication switching in En Route ATC facilities. The following benefits are non-quantified for Phase II tech refresh: VTABS Power Supply Replacement allows continued power supply backup to VTABS; Repeater/ LAN Modification allows future expansion of LAN; Depot Test Equipment allows continued depot-level repair, ensures timely depot-level repair, and eliminates dependency on PL/M SW engineers; PL/M to C++ Software

Conversion eliminates dependency of scarce PL/M SW engineers. In addition, VAX Compilers are obsolete; and Enhanced technician diagnostic software reduces technician fault assessment time and reduces depot test of non-faulted LRUs. Since the benefits were determined to be equal among the alternatives, investment decisions were made based on cost.

In-service engineering allows for immediate response to emerging technology solutions. Funding is requested for ongoing engineering support of all prototyping efforts.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	24	$1,540,250.7 [1]
FY 2009 Appropriated	---	23,300.0
FY 2010 Request	---	16,700.0
Baseline Requirement	---	15,900.0 [2]
Total	24	$1,596,150.7

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. VSCS Sustainment Activities	---	$8,314.0
2. Program Management	---	1,085.0
3. Contractor Support	---	3,578.0
4. Tech Operations Engineering Support	---	3,123.0
5. In Service Engineering	---	600.0
Total	Various	$16,700.0

[1] Includes $5,940 reduction of FY 2001 funds pursuant to rescission contained in P.L. 106-544. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.
[2] The JRC approved the VSCS baseline and has funded the program through FY 2011. The JRC requested the program return with results of the Ground to Ground Switch replacement study and a plan for Phase 3 with views on how to approach replacing G/G Switch VSCS.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A11	**Oceanic Automation System (OAS)**	**$7,700,000**	**Various**	**A-10, M-25, M-39**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 2 - Increase reliability and on-time performance of scheduled carriers.

Description of Problem: The FAA is allocated 80 percent of the world's controlled oceanic airspace. This airspace stretches beyond domestic coverage with its land-based ATC infrastructure, including radar. FAA provides air traffic control services for oceanic flights, within an area of approximately three million square miles in the Atlantic; and 21 million square miles in the Pacific. This airspace is not sovereign – it is delegated to Civil Aviation Authorities, of which FAA is one, by International Civil Aviation Organization (ICAO) - and can be reassigned at any time. This airspace is presently managed by three ATC facilities: Oakland, New York and Anchorage Air Route Traffic Control Centers (ARTCCs). Oceanic air traffic is projected to continue to grow at a higher rate than domestic air traffic, primarily in the highest density areas. In addition, the market demands expanded capacity through improved operational and fuel efficiency. The FAA's current oceanic system is approaching maximum operating capacity.

Oceanic ATC differs from domestic ATC largely because there is no radar tracking of aircraft and no direct radio communication. Oceanic air traffic controllers must rely on other sources of aircraft position information. This data includes voice position reports from pilots derived from on-board navigation systems that include GPS and communications satellite information. This lack of reliable and timely position information, in turn, requires large aircraft separation standards that severely limit the useable system capacity. As a result, oceanic users are rarely able to obtain maximum fuel efficiency, minimize travel times, and access to preferred takeoff times and flight paths. An integrated, modernized oceanic air traffic control system is required to increase oceanic air traffic capacity and efficiency, without degrading safety, enabling the introduction of free flight in oceanic air space.

Description of Solution: Prior to FY 2000, $188,900,000 was appropriated under the Oceanic Automation program line item to deliver incremental improvements in oceanic air traffic control systems at the Oakland, New York and Anchorage ARTCCs. These included Telecommunications Processor, Interim Situation Display, Oceanic Display and Planning System, Air Traffic Services Inter-facility Data Communications Systems and Oceanic Data Link. This money also funded the Dynamic Ocean Track System (DOTS) Plus, which suggests optimum tracks for airlines and air traffic controllers, and Micro-En Route Automated Radar Tracking System (Micro-EARTS), the ATC platform for the FAA's offshore sites. These projects established the oceanic automation and communications infrastructure that currently exists in the three oceanic ARTCCs. The incremental system improvements enabled reduced wing tip to wing tip aircraft separation to 50 nautical miles in the Pacific and West Atlantic Route System (WATR) regions in 2000.

The new oceanic automation system sets the stage for reducing aircraft separation from 100 nautical miles to 30. The Advanced Technologies and Oceanic Procedures (ATOP) program enable the flexibility and predictability required for additional fuel savings and increased airline revenue.

ATOP has replaced existing oceanic ATC systems and procedures with a single integrated system and modernizes facilities responsible for managing over 24 million square miles of airspace over the Atlantic and Pacific Oceans. ATOP integrates flight data processing, detects conflicts between aircraft, and provides satellite data link and surveillance capabilities. The new oceanic system collects, manages, and displays oceanic air traffic data, including electronic flight-strip data, on the computer displays used by air traffic controllers and integrate capabilities such as flight data processing, radar data processing, automatic dependent surveillance, controller pilot data link and conflict probe. ATOP provides a modernized oceanic air traffic control automation system including, installation, training, procedural development support and life-cycle system maintenance. The contract also allows for pre-planned product improvements over the system life-cycle.

In FYs 2000 - 2006, $399,938,381 was appropriated for acquisition ATOP hardware, software development, information security, logistics support, training, facility modifications, IOT&E, system testing and maintenance, in-service management and software improvements for Micro-EARTS and DOTS Plus, technical refresh for Micro-EARTS, decommissioning of Oceanic Display and Planning System (ODAPS), and program support activities. In addition, as Micro-Earts is a component of the ATOP architecture, and both Mirco-EARTS and DOTS+ and part of the ATOP baseline, funding is contained within this line item to improve platforms. The requested funding includes Oceanic NAS Plan Handoff, IOT&E and In-Service Management activities. Major accomplishments included awarding of the ATOP contract, delivery and installation of the ATOP system hardware at the three oceanic operational facilities (Oakland, New York and Anchorage) and William J. Hughes Technical Center. Oakland Center began early operational use in June 2004 and achieved full transition in October 2005. New York Center began initial live operations in March 2005 and achieved full transition in June 2005. Anchorage Center began initial live operation in March 2006 and achieved full transition in March 2007. ORD was achieved for both Oakland and New York March 2006. Anchorage achieved ORD in April 2008.

In FY 2007, $31,350,000 was appropriated to attain operational readiness at Anchorage, maintain operational readiness at New York and Oakland ARTCCs, continue implementation of Micro-EARTS technical refresh, provide for AT/AF training, information security, logistics support, system testing and maintenance, continue facility modifications at Oakland ARTCC, carry on the required level of program activities, enhance the Micro-EARTS and DOTS Plus software baselines, and IOT&E.

In FY 2008, $53,100,000 was appropriated to initiate ATOP technical refresh at the William J. Hughes Technical Center (WJHTC) and Oakland ARTCC which replaces operating systems and all major system components (e.g., servers, workstations, communications switches, and interface gateways) with state-of-the-art components, initiate ATOP Preplanned Product Improvements which includes enhancements to ATOP software to increase operational efficiency and controller productivity, complete facility modifications at Oakland ARTCC, maintain operational readiness at the Anchorage ARTCC, provide for second-level engineering support, information security, logistics support, and system testing, continue maintenance activities for the fielded systems, provide for the required level of program and engineering support, and make improvements to the Micro-EARTS and DOTS Plus software baselines, and for IOT&E.

In FY 2009, $20,700,000 was appropriated to complete the ATOP technical refresh at the William J. Hughes Technical Center (WJHTC) and the three oceanic sites, continue ATOP Preplanned Product Improvements for enhancements to ATOP software for procedural and radar operations, provide for information security and logistics support, provide for the required level of program and engineering support, and provide tech refresh for DOTS Plus.

For FY 2010, $7,700,000 is requested to continue ATOP Preplanned Product Improvements for enhancements to ATOP software for procedural and radar operations, provide for information security and logistics support, provide for the required level of program and engineering support, and provide tech refresh for DOTS Plus.

<u>Benefits:</u> Although oceanic flights comprise only four percent of total U. S. air carrier operations, they provide 49 percent of the international cargo revenue and 20 percent of the passenger revenue. The new automation system has reduced aircraft separation from 50 nautical miles lateral/10 minutes longitudinal to 30 nautical miles lateral/30 nautical miles longitudinal (equates to four minutes). Ninety percent more altitude change requests were granted at Oakland Center and New York Center in September 2005 versus September 2004. ATOP automation has allowed for the use of new routes from South America to New York, saving between 2000-4000 pounds of fuel per flight. ATOP increases oceanic capacity and efficiency, has mitigated potential cost of delays, and is expected to save airlines and aircraft operators more than $5 billion in fuel costs. ATOP has enhanced communication and surveillance, and increased sector capacity. Annual U.S. transoceanic revenues are projected to increase significantly by the year 2010.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	Various	$673,322.5 [1]
FY 2009 Appropriated	---	20,700.0
FY 2010 Request	---	7,700.0
Baseline Requirement	---	42,800.0
Total	Various	$744,522.5

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Prime Contract, Program Management, Depot Support	---	$1,300.0
2. Facility Modification and Site Support	---	300.0
3. Oceanic Integration and Interoperability Facility Lab	---	500.0
4. OAS Program Management	---	5,600.0
Total	Various	$7,700.0

[1] Includes $8,747,000 reduction for the FY 1998 Host/Oceanic Computer System Replacement (HOCSR)/Security Equipment formal reprogramming. Includes $81,900 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. Includes reduction pursuant to P.L. 108-7, February 20, 2003.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A12	**Corridor Integrated Weather System (CIWS)**	**$2,300,000**	**Various**	**W-07**

FAA Strategic Goals: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 2 - Increase reliability and on-time performance of scheduled carriers.

Description of Problem: Weather is the major contributor to air traffic delays, accounting for 65 percent of all delays. Significant convective weather causes wide spread impacts on the capacity of En Route airspace. The lack of accurate forecasts of storm position, and intensity and the lack of current and forecast storm (echo) tops information constrains the ability of traffic managers to maximize sector and route capacity in times of significant convective activity. Traffic managers in TRACONs, and En Route Centers as well as the ATCSCC lack the common situational awareness of current and future storm information to act effectively in collaboration to reduce congestion and delays.

Description of Solution: The CIWS program provides advanced weather product generation to help reduce convective weather delays. CIWS provides national, en route, and terminal air traffic flow managers and airline system operation centers (AOC) personnel with accurate, automated, rapidly updated weather information as well as weather products for integrated weather-Air Traffic Management (Wx-ATM) system to support the weather-assimilated decision making envisioned for NextGen. CIWS automatically produces weather products including storm locations, radar measured storm tops, and two hour storm forecasts including storm growth and decay. In addition CIWS uniquely provides a score of the recent performance of its predictions. The CIWS program supports the increased capacity goals of the agency's Flight Plan. CIWS requirements identify gaps for thunderstorm detection, forecasting and impact assessment for congested air corridors. CIWS requirements are allocated from the "Initial Program Requirements for Thunderstorm Impact Mitigation."

The CIWS project operates a demonstration system providing advanced weather products to the Command Center, eight ARTCCs and six TRACONs in the northeast. CIWS Coverage of the most heavily traveled areas of southern Canada provides an indication of route availability for the Canadian Playbook routes. The CIWS demonstration has shown that fully automated high resolution 3D weather information coupled with zero to two hour forecasts of storm locations can significantly improve the ability of ATC users to safely utilize the available capacity during severe convective activity. Air routes can be kept open longer before being impacted by weather, and can be reopened earlier. Similarly, better knowledge of future storm position allows more efficient rerouting around storms. Better information on current and predicted storm heights allows users to identify opportunities to safely fly over storm areas. This translates into substantial delay savings, user fuel savings, enhanced user safety, and well organized reroutes for weather avoidance. The CIWS has been shown to improve ATC productivity in terms of the time required to develop and execute effective convective weather mitigation plans. A key finding of the demonstration has been the importance of the CIWS advanced weather products integrated with traffic flow management tools and procedures. The CIWS demonstration system is undergoing a re-engineering effort to provide an increase in performance and maintainability as well as "harden" the CIWS source code. Plans are to transition the operation of the re-engineered CIWS system to the FAA William J. Hughes Technical Center (WJHTC) where it will be baselined into the NAS.

In FY 2008, $2,100,000 was appropriated. $1,800,000 was for CIWS algorithm development and development of a Technical Transfer Package, and $300,000 was for program support functions.

In FY 2009, $5,900,000 was appropriated. $500,000 is to secure CIWS facilities and associated resources at the WJHTC; $2,000,000 is to procure hardware; $1,800,000 is to engineer and implement input data sources at the WJHTC; $800,000 is to continue development of the Technical Transfer Package, $500,000 is for training program development and program support and $300,000 is for Independent Operation Test and Evaluation (IOT&E).

For FY 2010, $2,300,000 is requested for the following:

- $1,500,000 to procure hardware and software;
- $300,000 to complete sensor source data interface engineering, development documentation, unit/integration testing, and establish configuration management;
- $200,000 for technology transfer testing;
- $100,000 for technical program support; and
- $200,000 for IOT&E.

Benefits: CIWS benefits have been quantified during two benefits assessments during the convective seasons of 2003 and 2005. The methodology used in the studies to quantify CIWS operational benefits was a new approach that utilizes on site real-time observations during "benefits blitz" periods at operational facilities, together with studies of individual cases identified from the blitz observations and ongoing post event feedback from operational users. The analysis of individual cases often involved detailed calculations of queue sizes and durations.

Sixteen unique CIWS benefits categories were identified during the assessments. Observed CIWS applications included quantifiable benefits associated with keeping routes open longer and proactively rerouting planes during Severe Weather Avoidance Procedure (SWAP) events. The frequency of each type of CIWS application was tabulated for each facility and rolled-up to an annual CIWS benefits frequency estimate based upon the historical average number of SWAP days per year per facility.

Several CIWS benefits case studies were analyzed in an effort to quantify the delay savings associated with keeping routes open longer and proactive reroutes. Annual estimated CIWS benefits during 2005 totaled 40,000 hours of delay saved, with a cost savings of $125 million.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$15,200.0
FY 2009 Appropriated	---	5,900.0
FY 2010 Request	---	2,300.0
FY 2011-2014	---	8,500.0
Total	Various	$31,900.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Procure Hardware and Software	---	$1,500.0
2. CIWS Data Source Engineering	---	300.0
3. Technology Transfer Testing	---	200.0
4. Technical Program Support	---	100.0
5. Independent Operation Test and Evaluation	---	200.0
Total	Various	$2,300.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A13	**Next Generation VHF Air/Ground Communications System (NEXCOM)**	**$70,200,000**	**Various**	**C-06, C-21**

FAA Strategic Goals: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The existing Very High Frequency (VHF) analog controller-to-pilot communications system lacks the capacity and flexibility to accommodate future growth in air traffic. The FAA goal of Reduced Congestion is at risk due to the lack of available air traffic control radio spectrum in high-density areas. The continuous growth in air traffic and the introduction of new services has driven a proportional demand (approximately four percent per year) for air/ground communication frequency assignments. The system is beyond its estimated life-cycle and is increasingly expensive to maintain. Furthermore, the existing system has no security against unauthorized users and channel blockage. Air/Ground communication is the most fundamental and safety critical element of the ATC system and links supports all phases of flight for en route, terminal, and flight service operational environments. There are approximately 60,000 analog radio units installed at over 4,650 sites.

Description of Solution:

1. Next-Generation VHF A/G Communication System (NEXCOM) - Segment 1a - ($33,700,000):

Description of Solution: NEXCOM will implement a new air/ground voice communication system using the limited available radio frequency spectrum more efficiently. NEXCOM will provide the operational flexibility required for NextGen. NEXCOM will be implemented in two segments (previously three). Segment 1 addresses the En Route environment, and is divided into two phases, Segments 1a and 1b. Installation of Segment 1a multimode digital radios (MDRs) began in 2004. The radios can function in analog or digital modes, though only one at a time. The MDRs, which will initially operate in the analog channel mode, will be a major improvement to our aging air-to-ground communications infrastructure. NEXCOM Segment 1b, system hardware and software has been cancelled because the agency believes that the spectrum problem can be addressed by the combination of the MDR and the Data Communications Program. NEXCOM Segment 2 (2010+) will implement MDRs that will service the high-density terminal areas and the flight service operations.

By the end of FY 2007, over 4,200 multimode digital radios were operational at approximately 300 sites across the United States. In FY 2009, $33,400,000 was appropriated for program management, technical support, and to deploy multimode digital radios at 160 sites across the United States.

For FY 2010, $33,700,000 is requested for NEXCOM Segment 1a. Segment 1a multimode digital radios will be installed at 160 sites across the United States, including Alabama, Alaska, Arizona, Arkansas, California, Colorado, Florida, Idaho, Indiana, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maine, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Mexico, New York, Nevada, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming

Benefits: NEXCOM will meet the new and growing demands for air transportation services; accommodate the growing number of sectors and services; increase security by reducing circuit blockage and the risk associated from unauthorized access; and improve reliability by replacing aging air/ground communications equipment with new digital equipment.

2. Next-Generation VHF A/G Communication System (NEXCOM) - Segment 2/3 ($26,000,000):

Description of Solution: NEXCOM will implement a new air-to-ground voice communication system using the limited available radio frequency spectrum more efficiently. NEXCOM will provide the operational flexibility required for NextGen. NEXCOM will be implemented in two segments (previously three). The current NEXCOM Segment 2 was originally Segment 3.[1] The Data Communications Program will address the requirements of the original Segment 2. Segment 1 addresses the En Route environment, and is divided into two phases, Segments 1a and 1b. Under Segment 1a, installation of multimode digital radios (MDRs) began in 2004. These radios can function in analog or digital modes. The MDRs, which will initially operate in the analog channel mode, will be a major improvement to the existing aging air-to-ground communications infrastructure. NEXCOM Segment 1b, system hardware and software has been cancelled because the Agency believes that the spectrum problem can be addressed by the combination of MDR deployments and the Data Communications Program. NEXCOM Segment 2 (2010+) will procure and deploy VHF and UHF radios that serve high-density terminal areas and flight service operations.

At the end of FY 2007, over 4,200 multimode digital radios were operational at approximately 300 sites across the United States. In FY 2009, $3,000,000 was appropriated for NEXCOM Segment 2. This funding will enable the Agency to conduct an Investment Analysis and begin VHF and UHF radio procurements for Segment 2 terminal and flight service radio replacement in time to support NextGen.

For FY 2010, $26,000,000 is requested for NEXCOM Segment 2. The funding will procure and begin installation of 3,197 radios in the terminal and flight service facilities.

Benefits: NEXCOM will meet the new and growing demands for air transportation services; accommodate the growing number of sectors and services; utilize VHF spectrum required for voice communications more efficiently and make the recovered spectrum available for data communications (a future NextGen initiative); and improve reliability and reduce the growth of maintenance costs by replacing aging air/ground communications equipment with new digital equipment.

3. Communications Facilities Enhancement - UHF Replacement - ($10,300,000):

Description of Solution: For FY 2010, $10,300,000 is requested to procure 1,542 UHF radios, site preparation, training, and initial spares. The radios will be installed at multiple sites in Texas, Arkansas, Oklahoma, Kansas, Nebraska, Indiana, Missouri, Maine, Pennsylvania, Maryland, Virginia, California, Arizona, Florida, Georgia, Mississippi, Tennessee, Wyoming, Montana, Utah, Colorado, Wisconsin, Illinois, and Michigan. The UHF Replacement program[2] replaces UHF radios at remote communications facilities. UHF radios are being deployed concurrently with the multi-mode digital very high frequency radios to minimize implementation costs.

Benefits: The Air/Ground Communications Infrastructure program supports the FAA goal of Reduced Congestion. New and relocated communication facilities enable the establishment of new sectors to support capacity. In addition, new and relocated communication facilities will enable new and more efficient flight patterns. Efficient flight patterns reduce aircraft operations and maintenance costs for the airline industry. New communication equipment will lower periodic and correctional maintenance costs associated with the old and technically obsolete equipment in the field.

The UHF radio replacement program will provide significant benefits to the FAA. The UHF radios will be deployed concurrently with the multi-mode digital radios and will achieve minimum cost avoidance. Another benefit is the cost reduction of using existing radios removed from the en route facilities to meet near term non-en route growth requirements from 2004 – 2007. The difference between the cost of purchasing new radios and the cost of refurbishing and repackaging radios to meet these requirements will result in savings of $5,600,000 over four years. Deploying the radios concurrently also leaves the En Route air/ground remote sites with new, more reliable major components, which reduce maintenance expenses. The UHF radios also provide a vital part of the critical infrastructure supporting the nation's homeland defense efforts.

[1] The current NEXCOM Segment 2 was originally Segment 3. The Data Communications Program will address the requirements of the original Segment 2.
[2] The UHF Replacement Program has been transferred from BLI# 2A07 Air/Ground Communications Infrastructure.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	Various	$368,939.3 [1]
FY 2009 Appropriated	---	46,400.0 [2]
FY 2010 Request	---	70,200.0
Baseline Requirement	---	222,200.0 [3]
Total	Various	$707,739.3

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Program Management	---	$2,870.0
2. In-Service Management	---	1,560.0
3. Multimode Digital Radio Equipment	---	14,010.0
4. Logistics	---	870.0
5. Implementation	---	19,760.0
6. Hardware/Software	---	20,630.0
7. UHF Radio Replacement Equipment	---	10,300.0
8. Independent Operational Test and Evaluation	---	200.0
Total	Various	$70,200.0

[1] UHF Radio Replacement funding history transferred from BLI# 2A07. Includes $3,200,000 reduction for FY 1998 Congressional reprogramming and FY 2001 rescission reduction. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-199, January 23, 2004.
[2] Includes UHF radio replacement program.
[3] NEXCOM segment 1a and UHF radio replacement programs only. NEXCOM segment 1b has been cancelled and Segment 2 requires an executive investment decision.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A14	**System Wide Information Management (SWIM)**	**$54,600,000**	**Various**	**G-5C, M-25**

FAA Strategic Goal: Organizational Excellence -– Ensure the success of the FAA's mission through stronger leadership, a better trained and safer workforce, enhanced cost-control measures, and improved decision-making based on reliable data. Objective 3 - Improve financial management while delivering quality customer service.

Description of Problem: Today's hard-wired infrastructure and systems cannot readily support the addition of new data, systems, data users, and/or decision makers as NextGen requires. In general, they are connected discretely to support yesterday's decision-making needs. Each of these interfaces is custom designed, developed, managed, and maintained individually at a significant cost to the FAA. NextGen relies upon a new decision construct that brings more data, systems, customers, and service providers into the process. Data will be needed at more places, for more purposes, in a timely manner, and in common formats and structures to ensure consistent use. These new "data customers" need to be accommodated by providing the governance and policy that tell them how to connect to existing, open interfaces instead of designing, developing, testing, and implementing new ones. Network technology and data management software must use commercial equipment and current industry standards, reducing developmental and upgrade cost and simplifying maintenance. Specifically, the current FAA system architecture is overly expensive, and needed modifications are extremely costly and time consuming. It does not provide the network-enabled operational capabilities needed to meet future capacity demands. Today's point-to-point architecture does not support these tenets. This situation represents a performance gap that must be bridged for NextGen to be successful.

Description of Solution: The SWIM program is an integral part of the National Airspace System (NAS) Enterprise Architecture roadmap and will promote the development of a secure NAS-wide information web to connect FAA systems. SWIM will provide policies and standards to support data management, along with the mechanisms (i.e., commercial software) for the core capabilities needed to publish data to the network, retrieve it, secure its integrity, and control its access and use. SWIM will leverage existing systems and networks to the extent practicable, and be based on technologies that have been proven in both operational and demonstration environments to reduce cost and risk. SWIM will be developed incrementally based upon the needs of various data communities, maturity of concepts of use, and segments that are sized to fit reasonable cost, schedule, and risk thresholds.

SWIM represents the steps that FAA is taking to reduce costs while providing better service to:

- Change system interfaces to support network messaging, reducing the cost of testing and maintaining each individual interface (currently a major cost driver and resource load for NAS systems).
- Provide the flexibility to provide information to new systems and locations without adding custom interfaces. This will significantly reduce the marginal cost of adding new system interfaces.
- Provide common interfaces that facilitate spontaneously adding new users and applications, for purposes of continuity of operations.

The FAA's Joint Resource Council (JRC) approved the Initial Investment Decision for SWIM on July 17, 2006. The Final Investment Decision for Segment 1 approved by the JRC on June 20, 2007, and the JRC established the baseline for the first two years of Segment 1 (FY 2009 and FY 2010). The SWIM Program Office will return to the JRC in FY 2009 to establish a baseline for the remaining three years of Segment 1 (FY 2011-2013).

During FY 2009 and FY 2010, the implementing programs will perform detailed requirements analysis and begin work on the detailed design for the Segment 1 capabilities. FY 2011 - FY 2013 will include the implementing programs' design, code, test, and deployment of these capabilities.

For FY 2010, $54,300,000 is requested for the development of Segment 1. Efforts in FY 2010 include design, development, and test of initial Segment 1 capabilities. For FY 2010, SWIM will:

- Complete requirements definition for initial TFM flow object,
- Code and test ERAM initial flight data services,
- Complete AIM SUA development and test,
- CIWS software design and test, and
- Conduct analyses and prepare documentation for Final Investment Decision for Segment 2.

An additional $300,000 is requested for Independent Operational Testing and Evaluation (IOT&E).

Benefits: SWIM is vital to the achievement of National, DOT, and FAA strategic plans and the future evolution of air transportation management in the nation. The current FAA systems and operations cannot support this vision as they are not network-enabled, and are characterized by rigidly configured systems (communications lines, computers, and software applications). SWIM contributes to meeting the following NextGen objectives:

- Increase Predictability - SWIM will improve coordination to allow transition from tactical conflict management to strategic trajectory-based operations. SWIM will also provide the potential to increase machine to machine interchange supporting and disseminating decisions rather than the current man to man interactions. SWIM increases the likelihood that similar decisions will be consistent by enabling them to be based on the same data.
- Reduce Costs for Aviation - SWIM will help to reduce infrastructure costs by reducing the number and types of interfaces, systems, and potentially, facilities. Initially, SWIM will provide a common network capability, reducing operation and maintenance costs of the hundreds of current interfaces. New systems will interface with SWIM, saving future development costs. Ultimately, redundant sources of data will no longer be needed and can be decommissioned.
- Shared Situational Awareness - SWIM will help to provide shared situational awareness so that all appropriate parties are privy to the same complete set of information.
- Collaborative Decision Making - SWIM will help to enable collaborative decision-making which means that once all parties have access to the same information, they can efficiently make real-time decisions and quickly reach agreements.

SWIM will also provide benefit to the FAA resulting from new SWIM AIM functionality resulting in a reduction of staff time through automated processes.

NAS users will realize the benefits from the Weather Community of Interest's new capabilities, in which weather data are published to Airline Operating Centers (AOCs) as well as to the National Weather Service. Data will also be provided to airlines to improve efficiency in planning airport departures and arrivals, based on changes in runway visibility.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$47,358.0
FY 2009 Appropriated	---	43,042.5
FY 2010 Request	---	54,600.0
FY 2011-2014	---	108,700.0 [1]
Total	Various	$253,700.5

[1] Future requirements under review.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Automated Data Exchange	---	$1,031.6
2. Data Publications	---	30,806.4
3. SWIM Core Services	---	22,462.0
4. Independent Operational Test and Evaluation	---	300.0
Total	---	$54,600.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A15	**Automatic Dependent Surveillance Broadcast (ADS-B) National Airspace (NAS) Wide Implementation**	**$201,350,000**	**Various**	**G-2S, M-25**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 2 - Increase reliability and on-time performance of scheduled carriers.

Description of Problem: While current surveillance is generally adequate for today's environment, it will not support the anticipated growth in aviation without loss of efficiency within the National Airspace System (NAS). As the request for additional services – including traffic demand – increases, system inefficiencies will increase in the form of delays and restrictions across the NAS. Surveillance methods used in today's environment will not support continued aviation growth. Additionally, the current surveillance systems do not take advantage of new technologies in navigation, communication, and flight management. Expansion of surveillance coverage is essential to support air traffic control modernization efforts. Any improvements FAA makes to surveillance capabilities must sustain or enhance the current levels of safety, capacity, and efficiency.

According to the Joint Government and Industry Roadmap for Surveillance Modernization, the Air Traffic environment of the future will be increasingly dependent on more accurate and timely information being available to Air Traffic Service providers and aircraft operators. Information pertaining to a variety of airspace conditions and accurate position data, including aircraft intent, will be necessary.

Description of Solution: ADS-B is an advanced surveillance technology that provides highly accurate and more comprehensive surveillance information via a broadcast communication link. ADS-B is a surveillance technique in which aircraft provide, via a data link, flight data derived form on-board position-fixing and navigational systems. Aircraft determine their position (longitude, latitude, altitude, and time) using GPS, internal navigational reference system, or otherwise. The aircraft's ADS-B equipment function processes this position information, along with other aircraft-derived flight parameters, into a periodic broadcast transmission, typically once a second, of the aircraft's position. Any airborne or ground-based ADS-B capable receiver, within range of broadcast, may receive and process the surveillance information for a variety of functions or uses.

The greater positional accuracy and ability to provide aircraft-derived, additional flight parameters (flight objects or flight data message elements), in addition to position data, defines ADS-B as "enhanced surveillance." The aircraft provides unique flight parameter information with the broadcast of its surveillance position. These other parameters, such as identification, directional vector, velocity, next waypoint, and other data are limited only by the equipment's capability, the communication link capacity, and the receiving system's capability. Additionally, ADS-B equipment may be placed on ground vehicles or obstacles to allow locating and identifying these items. The FAA's ADS-B system is based primarily on providing three fundamental broadcast services to support the ADS-B enabled applications:

ADS-B: This service provides highly accurate, aircraft-derived ADS-B reports that contain identification, state vector, and status/intent information about the aircraft. The information will be used for surveillance applications. ADS-B information is broadcast by the ADS-B equipped aircraft, received and processed by the ADS-B on-board avionics, and displayed on the aircraft's multi-function display.

TIS-B: Traffic Information Services provide ADS-B equipped aircraft with a more complete "picture" in situations where not all aircraft are equipped with ADS-B. TIS-B is a service that provides ADS-B equipped aircraft with surveillance data about non-ADS-B equipped aircraft. TIS-B comprises surveillance information provided by one or more surveillance sources, such as secondary or primary surveillance radar. The surveillance information is processed and converted for use by ADS-B equipped aircraft. TIS-B can also be used in ADS-B implementations involving multiple ADS-B data links to provide a cross-link or gateway between ADS-B equipped aircraft using the different data links. This TIS-B sub-function is identified as Automatic Dependent Surveillance – Rebroadcast (ADS-R). Two communication link protocols have been approved for ADS-R use; Universal Access Transceiver (UAT), used mostly by general aviation aircraft, and the 1090 extended squitter, which broadcasts but does not receive signals, normally used in commercial transport aircraft.

FIS-B: Flight Information Services provide ground-to-air broadcast of non-control, advisory information which provides users valuable, near real-time information to operate safety and efficiently. FIS-B products include graphical and textual weather reports and forecasts, Special Use Airspace Information, Notices to Airmen, and other aeronautical information.

Prior Year funding focused on competing and awarding the service contract for the National program, to include turning on options for implementation of limited areas of ADS-B in the Gulf of Mexico (GOMEX), Juneau, Louisville/Philadelphia/Ontario, and an expansion of the TIS-B and FIS-B services in the East Coast, Great Lakes, and Southern California areas. FY 2008 activities focused on design reviews, testing and validation of the vendor designated architecture. FY 2009 activities include continuation of efforts started in FY 2007 and FY 2008 for ADS-B NAS-Wide implementation.

For FY 2010, activities will focus on attaining an in-service decision for ADS-B on July 9, 2010. To support this effort there is a need to obtain Initial Operating Capability (IOC) at each of the automation platform sites. The schedule is as follows:

- Louisville (SDF) IOC for CARTS Automation interface by October 30, 2009
- Philadelphia (PHL) IOC for STARS Automation interface by February 26, 2010
- Gulf of Mexico (GOM) IOC for ERAM/HOST Automation Interface by December 16, 2009
- Juneau (JNU) IOC for MicroEARTS Automation Interface by April 27, 2010

In addition to the above implementation activities, a corresponding effort is underway to publish a rule to the federal register addressing the mandatory equipage of ADS-B-out transponders in aircraft using specific airspace. This final rule is scheduled to be published to the federal register on April 30, 2010.

Benefits: The ADS-B, TIS-B, and FIS-B services provide new and improved operational capabilities. Service providers will use the new surveillance capability to provide ATC services. Users will use the surveillance and broadcast services capability to support flight operations.

Capacity and Efficiency: Airspace can be better utilized by providing the capability for reduced separation and allowing for greater predictability in departure and arrival times. ADS-B improves capacity and efficiency by:

- Providing radar-like separation procedures in remote or non-radar areas, possibly decreasing travel time;
- Supporting common separation standards (horizontal and vertical) in all classes of airspace;
- Improving the ability to manage traffic and aircraft fleets;
- Improving air traffic controllers ability to plan the arrivals and departures or aircraft in advance; and
- Providing the infrastructure necessary to operate the NAS at reduced cost.

Safety: ADS-B, TIS-B, and FIS-B helps to prevent accidents by providing increased situational awareness to air traffic controllers and pilots. ADS-B improves safety by:

- Provides air-to-air surveillance capability;
- Provides surveillance to areas that do not currently have surveillance coverage; and
- Provides real-time, in-the-cockpit, traffic, and aeronautical information. (weather, temporary flight restrictions, and special use airspace.)

The SBS benefits were estimated relative to the existing ATC system, with established procedures currently in effect. Historical data were combined with traffic projections to describe the baseline from which benefits could be measured. This reference point was modified, prior to estimating benefits, to reflect any approved future improvements to the baseline that are scheduled during the analysis time period. System effectiveness measures, the percent reduction in either accident rates or typical delay times, were applied to the estimated baseline level in order to derive expected benefits. The system effectiveness, the percent of the population equipped, and the percent of infrastructure installed are key drivers in all the benefit estimates. These factors combine to represent the level of benefits that are expected in the future.

The benefits are primarily associated with FAA cost avoidance, enhancements to safety, capacity and efficiency. The FAA cost avoidance is based on the ability to decommission a subset of Secondary Surveillance Radar and the Surface Movement Radar across the CONUS and a reduction in vendor subscription charges due to value added services. The safety benefits include reductions in accidents such as Midair Collisions, Weather Related Accidents, Runway Collisions, and Controlled Flights Into Terrain in the CONUS, HI, the Caribbean and Alaska, and improved Search and Rescue and improved Medical Evacuation for remote villages in Alaska. The safety enhancements are associated with air to air capabilities and TIS-B/FIS-B services. The efficiency benefits include reductions in weather deviations, reduced cancellations resulting from increased access to some Alaskan villages during reduced weather conditions, and reduced flight delay from increased approach capacity and efficiency at airports because of increased surveillance accuracy, additional controller automation, and additional aircraft to aircraft applications. The efficiency benefits translate to savings in both, aircraft direct operating costs and passenger value of time.

The historical baselines for the safety benefits were based on a careful review of National Transportation Safety Board (NTSB) aviation accident report, a 16-year period 1989 through 2004 was used. Appropriate database search methodologies were developed for each accident type for which reductions are expected. The set of accidents identified for each category were compared to ensure that specific incidents were not counted more than once towards the potential benefits. The total historical number of accidents for each accident type was tabulated by category of operations or accident composition and compared with traffic counts over the same time period to estimate accident rates. Existing mandates for certain aircraft classes (such as the Terrain Awareness Warning System) were accounted for prior to estimating the effectiveness of ADS-B capabilities.

The efficiency baseline is primarily defined in terms of flight hours, delay hours, and fuel burn. Flight and delay times were estimated for each user group and by location in order to reflect the baselines associated with each benefit element. Flight and schedule data from the Enhanced Traffic Management System (ETMS), Airline Service Quality Performance (ASQP), and the Official Airline Guide (OAG) were combined with weather observations from the National Climatic Data Center (NCDC) to generate baselines under differing operating conditions. The FAA Aviation System Performance Metrics (ASPM) database integrates this information and was accessed to generate the baseline metrics needed to accurately portray the potential efficiency benefits.

Both the safety and efficiency historical baselines are a function of traffic density. The baselines are combined with traffic projections from the FAA Terminal Area Forecasts (TAF) to develop forecasts of potential benefits each year. In addition, the timeframe for which each benefit starts to accrue is based on when the specific application is to be operationally certified to provide the desired outcomes as well as on user equipage and the commissioning of the necessary ground equipment.

The effectiveness percentages attributed to ADS-B equipment/services and the percent of the population anticipated to equip are multiplied with the potential benefits each year to develop annual benefit estimates. The effectiveness assumptions are based on a combination of subject matter expert assessments and the results from previous studies. The equipage percentages by user group and location were combined to reflect the likelihood of the benefits being realized depending on whether one or two aircraft are involved in the scenario, and whether or not ADS-B equipped aircraft can view transponder equipped aircraft through the availability of TIS-B functionality. To adequately represent the impact of TIS-B, the interaction of the two aircraft must be defined to determine which of the paired aircraft is equipped with ADS-B avionics. These relationships are considered in the estimates.

ADS-B is uniquely suited to support a full range of aircraft to aircraft based applications, due to the high data rate of the broadcast (once per second). These applications include those that require a high degree of "Shared Situational Awareness", where both the pilot and ATC are viewing a common picture simultaneously while interacting with the data. Prime examples include: 1) Airport Surface Situational Awareness and Final Approach and Runway Occupancy Awareness, where pilots can not only determine their position on the airport surface, but can view the movement of other aircraft relative to them on a surface moving map; and 2) Enhanced Visual Approach (EVA) applications (including Initial EVA in visual conditions, CDTI Assisted Visual Separation in reduced weather conditions, and Merging and Spacing), which will enable pilots to improve flight efficiency and regain lost capacity in a variety of weather conditions. Also, NextGen will require core technologies that are flexible and have additional growth capability to adapt to an ever-changing NAS. ADS-B is positioned to support these requirements.

The SBS program benefits analysis included the quantification of benefits for the time period 2008 to 2035. The SBS benefits estimate is $18.5 billion in constant 2007 dollars and $5.04 billion in risk-adjusted present value dollars.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$165,650.0
FY 2009 Appropriated	---	306,765.0
FY 2010 Request	---	201,350.0
FY 2011-2014	---	987,000.0 [1]
Total	Various	$1,660,765.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Solution Development	---	$93,837.4
2. Implementation	---	30,989.3
3. In-Service Management	---	75,573.3
4. Independent Operation Test and Evaluation	---	950.0
Total	Various	$201,350.0

[1] Future requirements under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A16	**Windshear Detection Services**	**$1,000,000**	**Various**	**W-05**

FAA Strategic Goals: Increased Safety -– To achieve the lowest possible accident rate and constantly improve safety. Objective 1 - Reduce commercial air carrier fatalities.

Description of Problem: Four major configurations of Low Level WindShear Alerting System (LLWAS) currently exist in the National Airspace System (NAS). These configurations are comprised of a substaintal number of proprietary software and hardware components, many of which have become obsolete . Multiple configurations and obsolesence make supportability difficult and costly. As identified in the NextGen Integrated Work Plan, a technology refresh will be necessary to maintain existing LLWAS service to 2025.

- LLWAS-RS (40) sites, (up to 10 pole mounted remote sensors per site) equipment manufactured by Climatronics Corp. and ASTI Corp and COTS suppliers.
- LLWAS-NE++ (11) sites, up to 32 pole mounted remote sensors per site manufactured in-house by ATO-W (AOS-250) from COTS components.
- LLWAS-2 (2) sites, up to 6 pole mounted remote sensors per site manufactured by either Loral or Climatronics Corp.
- LLWAS-WME (63) WME locations where LLWAS-2 was converted to WME single pole configuration - manufactured by either Loral or Climatronics Corp and multi-pole configuration (up to 6 pole mounted remote sensors) at 6 sites.

The 1994 Integrated Windshear Study is out of date and current data is needed to align Terminal Weather in the Enterprise Architecture and NextGen Roadmaps that will determine the future of the NAS. For example, a performance gap in wind shear detection at dry climate sites currently exists. Windshear is not always accompanied by sufficient precipitation for the Terminal Doppler Weather Radar (TDWR) to meet its specified 90% detection rate, and at airports in dry climate locations, the TDWR which was designed to perform optimally in wet climate conditions, does not meet current system specification.

Description of Solution: The FY 2008 Windshear Study updates the 1994 study and is revalidating service at 110 of the 158 airports that met cost benefit in the 1994 study. Additionally, the study will identify other airports that may meet the need for windshear detection services considering traffic growth and other determining circumstances in the NAS today. A business case for Windshear Detection Services is planned for a technology refresh of LLWAS at those sites where it is cost beneficial to do so, and to allow for new technology that may in some circumstances better satisfy the performance gap.

As identified in the Weather Roadmap, technology refresh will be necessary to maintain existing LLWAS service to 2025, along with the TDWR Service Life Extension Plan (SLEP) and Weather Systems Processor (WSP) Technology Refresh, until NextGen replacement technology is deployed and commissioned nationwide. The Windshear Detection Investment Decision will intersect at the same decision points (DP. 84 in 2016 and DP. 91 in 2018) that the other windshear detection system technology refresh efforts meet. The FY 2008 WindShear Study and FY 2009 Windshear Detection Business Case will identifyied in detail the technology refresh alternatives, activities, benefits, costs, and program options. A 2008 Diminishing Manufacturing Sources (DMS) Study will provide data to determine remaining spares, failure rates, replenishment rates, and replenishment sources leading to a loss of service estimate by site, system LRU and subassembly.

For LLWAS, the technology refresh may include or require: Master Station upgrade (one per site), upgrade multiple remote stations (6 to 12) per airport with one pole per Remote Station to be refurbished (Denver has 32 remote stations), display replenishment (1 to 3) ATCTs per site including Ribbon Displays, TRACON Displays, Display Selection Devices, solar power option redesign (10% of sites), software operating system rehost, firmware technology refresh, infrastructure assessment of poles, and NAS obsolescence issues

The FY 2008 Windshear Study may recommend continued service including new technology and may identify sites that newly qualify for service. One such technology is Light Detection and Ranging (LIDAR). LIDAR improves how controllers identify dangerous windshear conditions on approach or departure from runways.

LIDAR uses a laser in the infrared wavelength to detect aerosol particles and their associated motion. Windshear and turbulence algorithms are applied to LIDAR data to provide Air Traffic Control with windshear warnings. The technology minimizes clutter that TDWR is susceptible to, and as a result, the LIDAR is a viable WindShear detection alternative in the west where clutter is problematic and dry windshear is often not associated with rain. Four major U.S. airports with TDWR are located in such an environment – Denver International, Phoenix Sky Harbor, Salt Lake City International and Las Vegas McCarran. At those airports, LIDAR may work alongside TDWR to give controllers better detection of microbursts in both dry and wet climate conditions.

Benefits: Benefits will be defined in the LLWAS Technology Refresh business case in FY 2009.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$0.0
FY 2009 Appropriated	---	0.0
FY 2010 Request	---	1,000.0
FY 2011-2014	---	0.0
Total	Various	$1,000.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Windshear Detection	Various	$1,000.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A17	Weather and Radar Processor	$17,600,000	Various	W-04

FAA Strategic Goal: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 – Increase capacity to meet projected demand and reduce congestion.

Description of Problem: There is a critical need to provide accurate, reliable, tactical and forecast weather conditions to air route traffic control center (ARTCC) controllers, traffic management specialists, and center weather service unit meteorologists. This weather data will allow the FAA to provide timely weather advisories and accomplish its mission of safe and efficient air traffic control within the National Airspace System (NAS). The WARP Program provides accurate weather data to critical NAS programs such as En Route Automation Modernization (ERAM), Advanced Technologies and Oceanic Procedures (ATOP), and User Request Evaluation Tool (URET). The current WARP system addresses the following performance gaps:

- Integrates Weather radar data on air-traffic controllers' displays
- Provides access to radar mosaics and other key weather information to Area Supervisors and Traffic Management Personnel
- Interfaces with advanced weather sensors
- Plots and processes forecasted upper air wind and temperature gridded data
- Provides weather data to other NAS systems

Due to the WARP program's aging hardware and software infrastructure (unsupported operating system and HW equipment obsolescence), the existing architecture must be sustained and maintained until it is replaced. This will ensure that the weather processing and distribution capabilities continue to provide data which supports en-route controllers, traffic management specialists, and center weather service unit meteorologists who support air traffic.

Description of Solution: The WARP system is operational at the 21 ARTCCs and at the Air Traffic Control System Command Center (ATCSCC). Each operational WARP system consists of a Radar Acquisition and Mosaic Processor (RAMP) subsystem, a Weather Server, a Communications Subsystem, a Meteorologist's Workstation, Briefing Terminals, an ARTCC Monitor and Control Center (AMCC) workstation, and a Weather Information Network Server (WINS) subsystem. The ATCSCC WARP also includes the FAA Bulk Weather Telecommunications Gateway (FBWTG) server. The primary WARP functions are:

- Integrate timely and accurate weather onto air traffic controller displays;
- Support to the Traffic Management Unit and to air traffic control specialists at the ARTCCs and the ATCSCC;
- Disseminate weather data to critical NAS subsystems;
- Provide current and forecast data to Center Weather Service Unit Meteorologists, who support air traffic personnel, and
- Provide processing tools to consolidate weather data from several sources into a single, integrated display that supports air traffic operations.

The WARP program enhances safety, reduces weather-related delays, and improves collaborative decision-making. The WARP weather functions furnish timely, accurate and integrated weather products to other NAS systems.

All operational WARP systems must stay current with the NAS while continuing to meet DOT/FAA strategic goals by implementing incremental WARP technical refresh activities addressing critical hardware and software obsolescence. These goals include communications upgrades, mandatory security system test and evaluation (ST&E), implementation of mandatory security certification and authorization package (SCAP) mitigation activities, and the design and development of interfaces to critical NAS systems requiring weather data such as ERAM and Traffic Flow Management System (TFMS). In addition, the WARP system must continue building on its initial limited tech refresh activities focusing on the RAMP and WINS to be fully System Wide Information Management (SWIM) compliant. In FY 2009 the services of the operational WARP systems continued with completion of RAMP and WINS development.

For FY 2010, $17,600,000 is requested to sustain the operational WARP systems as well as achieve planned limited tech refresh activities to address the aging infrastructure of the existing WARP hardware and software systems. Specific activities include deployment of initial limited tech refresh, stratification of weather information to controller displays, data format adaptation changes, interface and communications implementation changes, incorporation of WINS Message Oriented Middleware (MOM) capability into the SWIM Service Container, removal and reengineering of Harris Weather Data Service, Automatic Product Generation (APG) processing and decoding server refresh activities, OMB required benefits assessment, as well as on-going required information systems security activities.

Benefits: WARP will continue to provide timely weather data acquisition and dissemination capability to ensure safe air traffic control. WARP provides for full FAA usage of NEXRAD Doppler weather radar information. WARP will also provide the most timely and accurate forecast weather products to other NAS systems, significantly improving NAS capacity.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$177,903.0
FY 2009 Appropriated	---	0.0
FY 2010 Request	---	17,600.0
FY 2011-2014	---	9,900.0
Total	Various	$205,403.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Windshear Detection	Various	$17,600.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2A18	Collaborative Air Traffic Management Technologies	$18,100,000	Various	G-5A

FAA Strategic Goals: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 2 - Increase reliability and on-time performance of scheduled carriers.

Description of Problem: Flight operations are approaching pre-9/11 levels, and aviation trends indicate that air traffic demand will continue to increase. Domestic, regional and commuter patterns and compositions are changing. Despite this growth, the economic viability of many commercial carrier airlines is uncertain. The Traffic Flow Management (TFM) portfolio of tools and capabilities is the only part of the national airspace system designed to help the aviation community reduce delays, improve operations, and succeed economically. However, the system cannot accommodate the anticipated growth in demand for services.

The existing TFM toolset will need to overcome the following challenges to meet the FAA's mission and customer expectations:

- Continued timely development and integration of sophisticated decision support tools to minimize NAS delays and improve efficiency
- Fiscal pressures forcing a reduction in the cost of ownership

Description of Solution: The FAA must maintain mission essential operations at all 81 TFM-equipped ATC facilities for its customers and continue to upgrade enhanced TFM services. Development of new, additional Collaborative Air Traffic Management Technologies (CATMT) provides direct mission support to the FAA by helping to ensure efficient flow of air traffic through the NAS.

TFM is the nation's primary source for disseminating flight information across the aviation community. The automation and communication mechanisms provided by the TFM system support the decision-making process used to adjust flight schedules and/or routes as necessary. When the NAS is impacted by severe weather, congestion, and/or outages, the TFM system has unique capabilities to predict chokepoints and facilitate the collaboration and execution of mitigation initiatives with stakeholders, using common information displays and tools, to minimize NAS delays. CATMT Work Package 2 is working on its business case development in order to recommend the set of key areas to pursue in the FY 2011 – 2014 time frame.

In FY 2009, $13,000,000 was appropriated under the Air Traffic Management budget line item to initiate the planning and development of CATMT Work Package 2 enhancements.

For FY 2010, $18,100,000 is requested to the development of CATMT Work Package 2 enhancements: Arrival Uncertainty Management (AUM) for better delivery projection modeling; Weather Integration (Wx Int) to include two hour advance forecast information on the TFM display; Airborne Reroute Execution to allow for automated in-flight reroute processing; and Collaborative Airspace Constraint Resolution (CACR) to allow for an automated combination of multiple flow strategy routines.

Benefits: The initial benefit estimate shows that over the period 2011 – 2025 Work Package 2 will generate approximately $780 million in ADOC benefits.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$0.0
FY 2009 Appropriated	---	0.0
FY 2010 Request	---	18,100.0
FY 2011-2014	---	234,900.0
Total	Various	$253,000.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
CATMT WP2	Various	$18,100.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B01	**Airport Surface Detection Equipment – Model X (ASDE-X)**	**$17,302,000**	**Various**	**S-09, M-25**

FAA Strategic Goals: Increased Safety -– To achieve the lowest possible accident rate and constantly improve safety. Objective 3 - Reduce the risk of runway incursions.

Description of Problem: During FYs 2001 – 2004, there were approximately 257 million aircraft operations and 1,395 runway incursions.[1] This represents an average of one runway incursion per day during the four-year period. The FAA has calculated, based on historical data, if the FAA and the aviation industry took no intervening action, 15 fatal runway collisions at towered airports would occur between 2003 and 2022.[2] These collisions could result in 200 serious injuries and 700-800 deaths. Airport Surface Detection Equipment, Model X (ASDE-X) meets a recommendation for the implementation of new surveillance equipment aimed at preventing collisions and runway incursions at a large number of airports.

Description of Solution: ASDE-X is a surface surveillance system that provides seamless multi-sensor airport surveillance with identification and conflict alerting to air traffic controllers. The ASDE-X system integrates five technologies: transponder multilateration, surface movement radar, Automatic Dependent Surveillance – Broadcast (ADS-B) data, multi-sensor data fusion, and control tower display equipment. The integration of these sensors provides data with the accuracy, update rate, and reliability suitable for improving airport safety and efficiency in all weather conditions. The ASDE-X is particularly useful as a traffic control aid during hours of darkness and other conditions of poor visibility.

ASDE-X was developed to aid in preventing surface collisions and reducing critical Category A and B runway incursions by enabling air traffic controllers to track the surface movement of aircraft and vehicles. ASDE-X provides air traffic controllers with a visual representation of the traffic situation on the airport movement area and arrival corridors. This improves their ability to maintain awareness of the operational environment and to anticipate contingencies.

ASDE-X Safety Logic (AXSL) enhances the situational awareness provided by ASDE-X. AXSL uses surveillance information from ASDE-X to determine if the current and projected positions and movement characteristics of tracked aircraft and vehicles present a potential collision situation. Visual and audible alerts are provided to air traffic controllers when safety logic predicts a collision.

The FAA plans to install 35 operational systems and three support systems. The systems will be installed at airports with no surface surveillance systems and airports with existing ASDE-3/AMASS systems. The FAA plans to deploy ASDE-X to ten new establishment airports (no current surface surveillance capability), four replacement airports (existing ASDE-3/AMASS systems will be replaced with ASDE-X), 21 ASDE-X Upgrade airports (ASDE-3/AMASS systems will be upgraded with ASDE-X capabilities such as multilateration, new color displays, fusion tracking, and AXSL).

[1] Source: "FAA Runway Safety Report: Runway Incursion Trends and Initiatives at Towered Airports in the United States, FY 2001 – FY 2004", August 2005.
[2] Source: "Fatal US Runway Collisions over the Next Two Decades", Air Traffic Control Quarterly, December 2000

ASDE-X program status as of February 2009:

- 17 commissioned airports

▪ General Mitchell International Airport, Milwaukee, WI	▪ Orlando International Airport, Orlando, FL
▪ Theodore Francis Green State Airport, Providence, RI	▪ William P. Hobby Airport, Houston, TX
▪ Seattle -Tacoma International Airport, Seattle, WA	▪ Lambert - St Louis International Airport, St. Louis, MO
▪ Hartsfield - Jackson Atlanta Int'l Airport, Atlanta, GA	▪ Bradley International Airport, Hartford, CT
▪ Louisville International Airport, Louisville, KY	▪ Chicago O'Hare International Airport, Chicago, IL
▪ Charlotte - Douglas International Airport, Charlotte, NC	▪ Washington Dulles International Airport, Chantilly, VA
▪ Detroit Metro Wayne County Airport, Detroit, MI	▪ Phoenix Sky Harbor International Airport, Phoenix, AZ
▪ John F. Kennedy International Airport, New York, NY	▪ Los Angeles International Airport, Los Angeles, CA
▪ Ft. Lauderdale / Hollywood Airport, Ft. Lauderdale, FL	

- Remaining eighteen (18) airports are in various stages of the ASDE-X implementation process

In FY 2008, $40,600,000 was appropriated to continue implementation activities including site design, construction, and site preparation and equipment installation at twenty four airports. This does not include the $4,900,000 appropriation to relocate the ASDE-X antenna at Seattle (SEA). Four ASDE-X systems will be delivered and three airports plan to achieve IOC. John F. Kennedy International Airport (JFK) was originally planned to complete IOC in FY 2009, but has been accelerated to complete IOC in FY 2008 at the request of the Acting Administrator Administrator. The program office also plans to complete the safety logic retrofit activity. For all future installations, ASDE-X Safety Logic will be implemented during the ASDE-X system installation. Remaining funds will be used for systems engineering, software maintenance, ICDLS, spare parts, second level engineering support, initial leased telecommunication services, information systems security requirements, and contractor support for the program office and all of the above activities.

In FY 2009, $33,400,000 was appropriated for implementation activities including construction and site preparation, equipment installation and system optimization at twenty one airports. The FAA will continue to implement the first dual ASDE-X Upgrade site at the Los Angeles International Airport (LAX). Nine ASDE-X systems will be delivered and four airports plan to achieve IOC. Remaining funds will be used for systems engineering, ICDLS, second level engineering support, initial leased telecommunication services, and contractor support for the program office and all of the above activities. Also, $300,000 was appropriated for Independent Operational Test and Evaluation (IOT&E).

For FY 2010, $17,302,000 is requested to implement activities including construction and site preparation, equipment installation and system optimization at sixteen airports. Four systems will be delivered and 13 airports plan to achieve IOC. Remaining funds will be used for systems engineering, ICDLS, second level engineering support, initial telecommunication services, and contractor support for the program office and all of the above activities.

<u>Benefits:</u> ASDE-X provides both safety and efficiency benefits. The primary benefit, increased safety, is achieved by providing air traffic controllers with improved situational awareness. ASDE-X functionality provides data tags for all transponder-equipped vehicles. The system also provides enhanced safety performance by supporting target projections and intersecting runway alerts. Moreover, through data fusion of multiple sensors (surface movement radar and multilateration inputs), more accurate positions with flight call signs and aircraft intentions are displayed on the controller's screen. This significantly improves controller common situational awareness, particularly during heavy periods of degraded weather or poor visibility. ASDE-X provides improved surface surveillance during heavy precipitation because rain has no impact on multilateration performance as it does on radar performance. Improved situational awareness will result in a reduction of surface deviations attributed to operational errors, reduce the number of runway incursions, and reduce the number and rate of general aviation and commercial accidents.

In addition to safety benefits, ASDE-X enables efficiency improvements by providing flight call signs for all transponder-equipped targets. As a result, controllers are able to view the ASDE-X display to determine the correct order of aircraft within queue, monitor whether aircraft are following their prescribed taxi routes, and, validate that the proper beacon code is associated with the radar target for each aircraft. Through the implementation of data tags, ASDE-X provides the ability to accurately identify each aircraft within a queue preventing unnecessary coordination and communications to determine the order of aircraft. This improved capability will reduce the time spent between clearance deliveries and in turn, lead to less taxi time and delays.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	38	$435,475.0 [1]
FY 2009 Appropriated	0	33,700.0 [2]
FY 2010 Request	0	17,302.0
Baseline Requirement	0	23,300.0
Total	38	$509,777.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Site Preparation/Related Activities	---	$5,000.0
2. Optimization/Enhancements/Engineering Services	---	10,102.0
3. Program Management	---	1,200.0
4. Second Level Engineering	---	1,000.0
Total	Various	$17,302.0

[1] Excludes $7.6M appropriated for ASDE-X under Airport Surface Detection Equipment (ASDE) in FY 2000. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.
[2] Includes $4.9M appropriated to relocate and upgrade ASDE-X system at Seattle-Tacoma.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B02	**Terminal Doppler Weather Radar (TDWR)**	**$9,900,000**	**Various**	**W-03**

FAA Strategic Goals: Increased Safety -– To achieve the lowest possible accident rate and constantly improve safety. Objective 1 - Reduce commercial air carrier fatalities.

Description of Problem: The TDWR system is now 18 years old. It is comprised of a substantial number of proprietary software and hardware components, many of which have become obsolete and present significant supportability problems that worsen with time. In addition, the system's radome and air conditioners have reached the end of their service lives and need to be replaced.

Description of Solution: Solutions to current supportability issues have been identified in the following nine service life extension program (SLEP) projects; enhancing the antenna's elevation gear system; replacing the Radar Product Generator (RPG) computer and rehosting its software; retrofitting the Radar Data Acquisition (RDA) hardware and software; replacing the current antenna drive motors with more reliable brushless motors; replacing the obsolete uninterruptible power supply for the RPG computer; replacing the obsolete transmitter control card and s; the obsolete radio frequency (RF) filter amplifier with modern equipment; and replacing the worn-out radomes and air conditioners with new equivalent units.

From FY 2002 through to FY 2008, $50,340,070 was appropriated under both the TDWR Product Improvement and TDWR SLEP to complete installation of the backup communications upgrade, procure spares and obsolete parts replacements, and complete the acquisition and installation of modification kits for the DDC hardware and software rehost. Funding was also provided for the acquisition, testing, and installation of the new elevation bearings, to develop improved software and hardware for the RDA retrofit modification, and to procure its field modification kits. Funding was also provided to procure and test four prototype antenna drive systems, and to continue procurement of spares and replacements for obsolete parts and assemblies. Additionally, $397,400 was appropriated for in-service management activities. Funding was also appropriated to procure 20 production antenna drive motor systems; develop and test a replacement for the obsolete RPG computer, develop and test a replacement RF filter amplifier, and acquire, and install production kits to replace three obsolete circuit cards with a new transmitter control circuit card.

In FY 2009, $6,100,000 was appropriated to complete the acquisition of a the retrofit modification to the RDA subsystem; to buy production antenna drive motor systems and begin their installation; to acquire and install a replacement RPG computer and its uninterruptible power system; and to replace the air conditioners at about half of the TDWR sites.

For FY 2010, $9,900,000 is requested to fund the installation of the RDA retrofit modification and continue improving its software; continue the acquisition and installation of the production antenna drive motor modification; continue the acquisition and installation of the replacement air conditioners, procure new RF Filter Amplifiers, complete the acquisition of the uninterruptible power systems for the RPG computers, conduct continuing logistics supportability studies; and begin replacing the radomes; and replace the air conditioners at the remaining TDWR sites.

Benefits: The TDWRs deployed at commercial airports have increased aviation safety through the accurate and timely detection of hazardous aviation weather conditions. Weather related delays have been reduced, allowing savings in aviation fuel consumption.

Operational benefits of the system include the real-time detection of microbursts, gust fronts, wind shifts, and precipitation, as well as prediction of wind changes that allow improved airfield efficiency when making runway changes. The program will continue to deploy improvements that will lower TDWR operations costs and improve its reliability.

APPROPRIATION SUMMARY

	Locations	Amount ($000)	
Appropriated (FY 1982-2008)	47	$449,017.5	[1]
FY 2009 Appropriated	---	6,100.0	
FY 2010 Request	---	9,900.0	
Baseline Requirement	---	18,900.0	[2]
Total	47	$483,917.5	

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Engineering Development/Implementation of SLEP Projects	Various	$9,900.0

[1] Includes $130,400 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999 and EAS. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.
[2] The future requirements for TDWR SLEP are under review and final estimated costs have not yet been determined.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B03	**Standard Terminal Automation Replacement System (STARS) (TAMR Phase 1)**	**$28,000,000**	**Various**	**A-04**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion

Description of Problem: STARS automation systems have been operational at terminal facilities, both terminal radar approach control facilities (TRACONs) and air traffic control towers (ATCT) across the National Airspace System (NAS) since FY 2002. The STARS system consists almost entirely of Commercial-Off-the-Shelf (COTS) hardware and Commercially Available Software (CAS). Because COTS/CAS system are based on what is available in the commercial marketplace, there is a need to continually replace systems software and components when they have been identified as either End of Life (EOL) and/or End of Maintenance (EOM) items. Therefore, it is necessary that the STARS system is maintained using Technical Refreshment of the COTS/CAS components which have been identified as EOL or EOM.

1. Terminal Automation Modernization (STARS) Phase 1 Enhancements ($10,000,000):

Description of Solution: The FAA is implementing Terminal Automation Modernization in a phased approach, starting with the TRACONs that have the oldest terminal automation systems. This approach reflects FAA's current philosophy in maintaining business continuity and effective program management. Phases mitigate government, vendor, and deployment costs and risks by breaking down large, complex Terminal modernization acquisitions. Phases allow FAA to select a "best value" system, meet budgetary constraints and fulfill critical NAS requirements. Each phase will be justified, priced and presented separately to the Joint Resource Council (JRC). The STARS Program and the associated baseline cover the initial replacement of 47 of the current 162 operational Terminal Automation Systems.

The STARS program replaces the 47 oldest and most operationally critical ARTS IIIAs (43), and Common ARTS IIEs (4) sites. In April 2004, the FAA approved STARS as the replacement solution for these critical sites and approved the new baseline for the program.

In subsequent phases, the FAA will evaluate viable alternatives for completing terminal modernization at remaining sites, based on cost benefit and performance.

In FY 2008, $16,500,000 was appropriated for terminal enhancements. These activities include STARS software enhancements as well as other various system enhancement activities. As STARS enters the operational phase of its life-cycle, software enhancements are required for the baseline software to improve system performance, efficiency, ease of use and support, and incorporate safety and security modifications. These software baseline enhancements are required to ensure the agency continues to meet its strategic goals for increased safety and greater capacity as identified in the FAA Flight Plan, 2005 - 2009. Additionally, funding will cover program and system engineering technical support, and operational/suitability testing of software and system enhancements.

In FY 2009, $10,000,000 was appropriated for terminal enhancements. These activities include STARS software enhancements as well as other various system enhancement activities. As STARS enters the operational phase of its life-cycle, software enhancements are required for the baseline software to improve system performance, efficiency, ease of use and support, and to incorporate safety and security modifications. These software baseline enhancements are required to ensure the agency continues to meet its strategic goals for increased safety and greater capacity as identified in the FAA Flight Plan, 2005-2009. Additionally, funding will cover program and system engineering technical support, and operational/suitability testing of software and system enhancements.

For FY 2010, $10,000,000 is requested for terminal enhancements. These activities cover STARS software enhancements. With STARS firmly established in the operational phase of its life-cycle, software enhancements are required for the baseline software to improve system performance, efficiency, ease of use and support, and to incorporate safety and security modifications. These software baseline enhancements are also required to ensure the agency continues to meet its strategic goals for increased safety and greater capacity as identified in the FAA Flight Plan, 2006-2010. The funding will provide program and system engineering, technical support, and operational/suitability testing of software and system enhancements.

Benefits: The STARS system is fully digital and capable of tracking all aircraft within the defined terminal airspace using available FAA and DoD surveillance or with system upgrades to global positioning satellite reports. It provides functions equivalent to or better than those accomplished by the existing terminal automation systems along with enhanced security. It is designed to incorporate new functionality more quickly and easily. The STARS infrastructure can be expanded and extended to meet increased traffic demands and accommodate the introduction of new automation functions necessary for improved safety, efficiency, and capacity.

2. Terminal Automation Modernization (STARS) - Tech Refresh ($18,000,000):

Description of Solution: For FY 2010, qualification of an upgrade processor configuration to replace the two current Sun Ultra 5 systems will be completed. Initial hardware will be procured to begin support of the site replacement configuration in FY 2010. The STARS program currently uses the processor, developed in the mid 1990s, initially fielded in 2000, has pass the EOM date of May 2008. The FAA can support the Ultra 5 systems until FY 2014 time when the internal battery, a unique item, is no longer usable or available. Full replacement of the Ultra 5s must be completed by 2014. Path finding to eliminate an operating system dependency and move closer to a fully open system will continue. This is a multi-year effort that will ultimately lead to reduced support costs. Engineering and path finding to update the current system network to meet anticipated future NextGen needs and system obsolescence will be funded.

For FY 2010 funding is requested to integrate, test and qualify a Sony Main Display Monitor (MDM) replacement. MDM deployments must begin in 2011 to enable the existing Sony MDM to be replaced at all sites by 2015. Sony support, of the existing monitors, will end in 2015 and replacement CRTs will not be available.

Procurement of TDM Gen 2 or a new replacement unit will continue as all Gen 1 units will become less supportable due to unavailability of replacement flat panels integral to the unit. Additionally, path finding to procure a cheaper, simpler TDM unit in the future will be funded.

These upgrades will enable the STARS to adapt to the future NextGen platform applications, SWIM and other as yet undefined FAA initiatives. As these upgrades are fielded the new technologies used will permit increased capability to meet future needs.

For FY 2010, funding for four ECP's per year is requested. This is an on-going task which requires continual monitoring and replacement of system components due to due to COTS vendors EOL and EOM announcements. This is a risk reduction and cost stabilizing activity.

Benefits: Technical Refresh of the STARS system will provide continued terminal services by replacing the original system Ultra-5 processors that have reached their end of maintenance. Replacement of these processors must begin in the FY 2009 period and will complete in the FY 2014 period. This will remove the Ultra-5's from service as their battery life expires. Adequate batteries were procured as a one-time buy to insure utilization of the Ultra-5 processors until FY 2014. A further procurement will not be available.

To enable the replacement of the Ultra 5s qualification of a new processor, typically an 18 to 24 month period, must begin in FY 2009 and continue into FY 2010 - 2011 where procurement for the first block replacement/upgrade of sites in FY 2011 will begin. This will enable current availability to be kept and allow for expansion into proposed NextGen activities as they are fielded. The new generation of processor's will enable STARS to move into a more open architecture providing benefits in increased MTBF and potentially lower overall system operating costs.

Fielding of the new generation processor, will require a new Operating System (OS). New generation processors will not run on the current fielded OS. This activity is typically an 18-24 month activity and must run concurrently with qualification of new hardware. A new OS will potentially provide security and others benefits. Additionally, the new OS is open source and will enable STARS to take advantage of this in the future.

The SONY Main Display Monitor (MDM) will need to be replaced beginning in FY 2011. Engineering work for identify and integrate a replacement will begin in FY 2009 and continue into FY 2010 to ensure a display replacement is available in a timely manner. The new display will provide lower operating costs and increased MTBF.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$1,755,020.6 [1]
FY 2009 Appropriated	---	28,200.0
FY 2010 Request	---	28,000.0
Baseline Requirement	---	1,175,800.0 [2]
Total	Various	$2,987,020.6

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. STARS Technology Refresh	---	$10,000.0
2. STARS Software Enhancements	---	18,000.0
Total	Various	$28,000.0

[1] Includes $651,300 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.
[2] Future production/deployment requirements for remaining 106 systems are under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B04	**Terminal Automation Modernization/Replacement Program (TAMR Phase 3)**	**$3,000,000**	**Various**	**A-04**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: This program would address the Modernization and Replacement of the ARTS IIIEs and ARTS IIEs. A total of approximately 106 sites are covered by Phase 3. These automation systems that currently provide the National Airspace System (NAS) critical separation and capacity services must be sustained and upgraded to maintain evolving and increasing functionality. These older systems, especially ARTS IIEs, are limited in capacity, and many may be unable to support future growth projections and new functionality. Those sites and systems can present an operational risk to service. Because of this risk, systems at the Terminal Radar Approach Control (TRACON) and Air Traffic Control Towers (ATCTs) need to be upgraded or replaced in the near future.

Description of Solution: These systems integrate data from radar and weather sensors and flight plan information for each aircraft into a graphical and textual presentation used by several thousand air traffic controllers. The solution to modernization and replacement is not yet known. Funding is needed to perform analyses and performance assessments, analyze alternatives, develop and implement the selected alternative, implement acquisition strategies, and test appropriate COTS hardware.

In FY 2009, $3,000,000 was appropriated to plan for the program scope, business case analysis and initial development of Terminal Automation solutions for the remaining approximately 106 sites. This funding is required for analysis and preliminary development efforts.

For FY 2010, $3,000,000 is requested to complete the planning and business case development activities, to obtain a JRC Investment Decision, begin prototype production, and testing of displays and processors.

Benefits: The Terminal Automation Modernization and Replacement System will replace and/or upgrade the existing automation to a state-of-the-art digital, radar and flight data processing and display system, providing new air traffic control "workstations" and backroom automation equipment to enable safe control of airplanes and enable continued service at current and future projected levels.

Qualitative benefits (cost avoidance) are expected such as avoiding costs to maintain aging equipment, lifecycle benefits of common displays and processors, and common hardware for re-use and expansions. Qualitative benefits are expected to enhance controller's situational awareness, and discerning weather and reducing the risk through efficiency and commonality.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$0.0
FY 2009 Appropriated	---	3,000.0
FY 2010 Request	---	3,000.0
FY 2011-2014	---	246,700.0 [1]
Total	Various	$252,700.0

[1] Future requirements are under review.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
TAMR Phase 3	---	$3,000.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B05	Terminal Automation Program	$9,600,000	Various	A-01, A-03

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The FDIO equipment operates on older 1980s technology which limits system capacity and increases the difficulty in maintaining the systems. The program has been replacing obsolete/end-of-life components in the system since 1998. However, by FY 2010, components procured and replaced between 1998 and 2007 will again reach the end-of-life or become obsolete, requiring another cycle of technical refresh. For example, the personal computers, keyboards, CRT monitors, and printers are key components of the system that will require replacement. FDIO capability and services are required in the NAS until they are replaced by future NextGen technologies such as Terminal Flight Data Management (TFDM) system and/or NextGen Virtual Towers, in the 2020 timeframe.

1. Flight Data Input/Output (FDIO) Phase II COTS Replacement ($2,400,000):

Description of Solution: In FY 2009, $2,300,000 was appropriated to complete the replacement of the FDIO Central Control Unit (CCU) at 16 ARTCCs.

For FY 2010, $2,400,000 is requested to: (1) complete an operational analysis of the existing FDIO systems at TRACONs, ATCTs, and ARTCCs in order to identify/validate hardware and software technical refresh requirements; (2) develop solutions for replacement/modernization of end-of-life/obsolete components; and, (3) begin the procurement of replacement equipment necessary for continued FDIO operation.

Benefits: These activities ensure the availability and reliability of system hardware and software to support current system capabilities and NAS modifications/enhancements. The modifications help improve airport arrival efficiency, and enhance safety and system utility. Modernization of system hardware also reduces operating costs associated with maintaining older COTS equipment that has reach the end of its useful life or is obsolete. Additionally, the FDIO will support NAS modernization efforts by providing a platform to enable SWIM capabilities.

2. Electronic Flight Strip System ($6,200,000):

Description of Solution: The deployment of electronic flight strip (EFS) systems will provide controllers with electronic tools and functions to better manage AT operations, facilitating a safer and more efficient Air Traffic Control (ATC) operational environment. The system will support TRACONS of all sizes includes consolidated facilities, single ATCT, and multiple ATCTs in the efficient distribution and management of electronic flight plan operations and sharing of flight plan data and system information.

An EFS system provides controllers with the ability to electronically manage flight progress strips. The EFS will provide an automated means for flight data objects to be updated and transmitted between controller positions as well as ATC facilities. An EFS system allows AT controllers to make flight plan changes, make local notes and transfer strips between positions. Flight data information is transferred from the FDIO system and displayed at each of the controller's positions in the ATCT and TRACON. The controllers have the ability to amend and transfer the flight strips between controller positions as well as between ATC facility locations. Once a flight plan is received from the Flight Plan Data Source (Host/ERAM) located at the Air Route Traffic Control Center (ARTCC), the EFS system will receive and disseminate the information electronically at the appropriate ATC positions.

In addition, the EFS system will accommodate the printing and viewing of ATC and EFS system performance data. The performance data will include capabilities such as system failures, error logs, etc. To further facilitate terminal communications and coordination, controllers will be able to enter operational information in selective flight plan data fields.

Benefits: An EFS system will avoid the cost of using thermal printers and special paper to print flight strips; and, avoid the cost of maintaining the EFSTS systems at locations where the EFS system is deployed.

3. Terminal Flight Data Management System ($1,000,000):

Description of Solution: For FY 2010 $1,000,000 is requested to develop the business case and establish a program baseline. A solution for delivering the capabilities envisioned by the TFDM concept needs to be defined and developed.

Benefits: Benefits will be identified and quantified during the investment analysis in 2010/2011.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$71,857.0
FY 2009 Appropriated	---	4,300.0
FY 2010 Request	---	9,600.0
FY 2011-2014	---	13,600.0
Total	Various	$99,357.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Flight Data Input/Output	---	$2,400.0
2. Electronic Flight Strip	---	6,200.0
3. TFDM Business Case Analysis	---	1,000.0
Total	Various	$9,600.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B06	**Terminal Air Traffic Control Facilities – Replace**	**$176,000,000**	**Various**	**F-01**

FAA Strategic Goals: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The FAA provides air traffic control services from over 500 airport traffic control towers (ATCT) and terminal radar approach control (TRACON) facilities. The FAA must continually replace portions of this infrastructure to ensure an acceptable level of air traffic control service and to meet current and future operational requirements. The average age of an ATCT is 28 years and a TRACON is 25 years, with some as much as 50 years old. As the volume and complexity of terminal air traffic control increases, so does the need to have additional positions in the ATCT/TRACON (i.e., helicopter positions, VFR traffic advisory, runway monitors, etc.). In many cases, control towers and TRACONs built 20 years ago do not meet today's operational requirements. The terminal facilities must conform to current building codes and design standards.

Description of Solution: The ATCT/TRACONs that cannot meet current operational requirements are being identified for replacement. Additionally, the FAA will determine the cost and operational benefit of collocating TRACONs that have common boundaries. When building a new facility, future growth and current building codes and design standards will be accommodated.

Terminal facility replacement projects are funded in five phases to provide sound financial management of projects. Phase I includes site selection and advance engineering. Phase II provides facility design, and electronic equipment design and procurement. Phase III is facility construction. Phase IV is equipment and utilities installation. Phase V is disposition, which includes decommissioning, demolition, or refurbishing of the old facility.

The FAA is in the process of developing a long-term Facilities Master Plan for ATCT and TRACON infrastructure replacement and improvements. This plan will address facility condition, ability to meet current needs, future growth and improvements at the airport served, and potential cost savings initiatives. The proposed list of projects for FY 2010 was developed in concurrence with the plan.

In FY 2008, $145,530,000 was appropriated to fund five phases of facility deployment to continue replacing aging facilities. This includes: Phase I/II funding for 11 sites, including Abilene, TX, Palm Springs, CA, Traverse City, MI, Ft. Lauderdale, FL, Oakland, CA, Orlando, FL, Greenwood, MS, San Francisco, CA, Barnstable, MA, Nantucket, MA and Toledo, OH; Phase III construction funding for seven sites, Kalamazoo, MI, Jeffco, CO, West Palm Beach, FL, Reno, NV, Houston, TX, Gulfport MS and Boise ID; and, Phase IV/V continuation funding for six sites, including La Guardia, NY, Memphis, TN, Pensacola, FL, Medford, OR, Missoula, MT and Dayton, OH. Additional funding in the amount of $17,100,000 was appropriated for other direct program costs. Products and services delivered include: the Dulles, VA ATCT (IAD) lease payment, formal facility requirements documentation, siting evaluations for all ATCT locations under consideration, preliminary engineering, and program management.

In FY 2009, $136,545,476 was appropriated to fund five phases of facility deployment to continue replacing aging facilities. This includes: $7,350,000 for Phase I/II funding for seven sites, Baltimore, MD, Champaign, IL, and Columbia, SC; Palm Springs, CA, San Francisco, CA, Nantucket, MA, Greenwood, MS; $93,131,434 for Phase III construction for five sites, Abilene, TX, Ft. Lauderdale, FL, Traverse City, MI, Las Vegas, NV, and Cleveland, OH; and $22,134,042 for Phase IV/V continuation for seven sites, Pensacola, FL, Kalamazoo, MI, LaGuardia, NY, Islip, NY, Medford, OR, Dayton, OH and Memphis, TN. Also appropriated was $13,930,000 for other direct program costs. Products and services delivered include: the Chicago, IL ATCT (ORD) lease payment, formal facility requirements documentation, siting evaluations for all ATCT planning locations under consideration, preliminary engineering, and program management.

Also in FY 2009, $79,056,761 was appropriated under the American Recovery and Reinvestment Act (ARRA). With this funding, the program plans to award three tower construction contracts; Wilkes Barre, PA ($17,756,761); Palm Springs, CA ($21,100,000); and Oakland, CA ($40,200,000).

For FY 2010, $176,000,000 is requested to fund five phases of facility deployment to continue replacing aging facilities. This includes: $6,379,000 for Phase I/II for one site, New York, NY; $109,735,105 for Phase III construction funding for four sites, Las Vegas, NV, Fort Lauderdale, FL, Champaign, IL, and San Francisco, CA; and $51,431,364 for Phase IV/V funding for 16 sites, Dayton, OH, Houston, TX, Gulfport, MS, Kona, HI, Memphis, TN, Reno, NV, Broomfield, CO, LaGuardia, NY, Pensacola, FL, Missoula, MT, Cleveland, OH, Traverse City, MI, Kalamazoo, MI, Islip, NY, Las Cruces, NM, and West Palm Beach, FL. Also requested is $8,454,531 for other direct program costs. Products and services delivered include: formal facility requirements documentation, siting evaluations for all ATCT planning locations under consideration, preliminary engineering, and program management.

Benefits: The terminal air traffic control facilities replace program contributes to FAA's system efficiency goal. New and replacement facilities support the NAS modernization strategy achieve efficient aerospace systems and operations. Strategic location, adequate height, and cab size of an airport traffic control tower will provide an efficient working environment, enable controllers to achieve an aerial view of the airport and fulfill the requirement to be able to see aircraft at the outer aircraft movement areas. This will result in enhanced safety and increased capacity, which will benefit the users.

Replace Terminal Air Traffic Control Facilities:

Phase I/II – $6,379,000 is requested for one design start.

New York, NY - $6,379,000

Phase III - $109,735,105 is requested for construction of four facilities started in previous years.

Fort Lauderdale, FL - $8,951,000	Champaign, IL - $8,368,553
Las Vegas, NV - $71,415,552	San Francisco, CA - $21,000,000

Phase IV/V - $51,431,364 for 16 facilities started in previous years.

Dayton, OH – $1,121,654	Houston, TX - $8,990,000
Gulfport, MS - $5,642,940	Pensacola, FL - $1,278,010
Missoula, MT - $923,200	Reno, NV - $1,301,742
Memphis, TN - $3,821,375	Cleveland, OH - $5,095,000
West Palm Beach, FL - $1,508,455	LaGuardia, NY - $1,406,000
Traverse City, MI - $3,501,458	Kalamazoo, MI - $6,992,500
Kona, HI - $3,160,000	Las Cruces, NM - $100,000
Islip, NY - $358,515	Broomfield, CO - $1,180,000

Other - $8,454,531 is requested for other direct program costs:

Advance Requirements Definition	$1,150,000
Engineering, Siting, and Program Management	$7,304,531

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	487	$1,873,318.5 [1]
FY 2009 Appropriated	19	136,545.5
FY 2009 American Recovery and Reinvestment Act	3	79,056.8
FY 2010 Request	21	176,000.0
FY 2011-2014	25	640,000.0
Total	555	$2,904,920.8

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Phase I–V Funding	21	$167,545.5
2. Advance Requirements Definition	---	1,150.0
3. Engineering, Siting and Program Management	---	7,304.5
Total	21	$176,000.0

[1] Includes $9,300,900 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. Includes $9,854,675 reduction of the FY 2001 funds pursuant to rescission contained in P.L. 107-87, December 18, 2001. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B07	**Airport Traffic Control Tower (ATCT)/Terminal Approach Control (TRACON) Facilities – Improve**	**$38,900,000**	**Various**	**F-01, M-08**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 Increase- capacity to meet projected demand and reduce congestion.

Description of Problem: The FAA must continually upgrade and improve aging terminal facilities and equipment to provide an acceptable level of service and to meet current and future operational requirements. Upgrades and improvements include replacing obsolete equipment, such as tower cab consoles, and rehabilitating administrative and equipment space due to facility expansion. Facility expansion includes adding operational positions, training space, base-building construction, and environmental equipment, accessibility, structural and electrical upgrades.

Facility improvements must incorporate new requirements and ensure an orderly transition to the new arrangement, for relocated or replaced equipment, with minimal impact to existing operations. The power and heating, ventilation and air conditioning (HVAC) systems at many terminal facilities must be upgraded to handle both the new and old equipment during the in-service change-out. A successful transition of improvement projects is critical. In many towers, there is no room for additional equipment; therefore, base buildings must be expanded.

An initial screening indicated a number of FAA ATCT/TRACON buildings do not meet Federal Emergency Management Agency (FEMA) criteria for seismic activity. This program improves the capability of facilities to withstand a seismic event in accordance with FEMA and Department of Transportation directives.

Facility condition assessments are necessary to determine the overall needs for facility improvements and to prioritize locations for investing improvements. These assessments are an in-depth evaluation of all the components of a facility.

Description of Solution:

In FY 2009, $943,239 was appropriated under the American Recovery and Reinvestment Act (ARRA) for the following modernization projects plan; Bakersfield, CA ($150,000); Lincoln, NE ($521,801); and Westbury, NY ($271,438).

For FY 2010, $38,900,000 is requested as follows:

- $31,049,000 to initiate seismic modifications, improve repair, and sustain ATCT/TRACON facilities that are not candidates for replacement. This funding includes the relocation of approach control functions to other existing locations, reducing the number of approach control facilities, while providing the same service.
- $4,500,000 to support system engineering, configuration management, risk management, facility planning, and other program support services.
- $1,751,000 for facility condition assessments.
- $1,600,000 for in-service engineering

Benefits: The ATCT/TRACON Terminal Facilities Improvement Program (TFIP) contributes to FAA's goals. Upgrading and improving facilities supports the NAS modernization strategy to achieve efficient aerospace systems and operations. Improvement projects will enable facilities to maintain current operational, environmental, and safety needs in lieu of replacing or relocating the entire facility. This effort will result in a smooth and orderly transition of new equipment into the FAA's terminal facilities. This will also improve the operational efficiency and environment of equipment operating within ATCT/TRACON facilities.

In-service engineering allows for immediate response to emerging technology solutions. Funding is needed for ongoing engineering support of all prototyping efforts.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$629,378.3
FY 2009 Appropriated	---	37,900.0
FY 2009 American Recovery and Reinvestment Act	---	943.2
FY 2010 Request	---	38,900.0
FY 2011-2014	---	206,700.0 [1]
Total	Various	$913,821.5

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Costs ($000)
1. Improve Terminal Facilities - Modernize	---	$6,080.0
2. Improve Terminal Facilities - Sustain	---	24,969.0
3. System Engineering/Program Management	---	4,500.0
4. Facility Condition Assessments	---	1,751.0
5. In-Service Engineering	---	1,600.0
Total	Various	$38,900.0

[1] Future requirements are based on activity levels and local situations that are validated on a year-to-year basis.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B08	**Terminal Voice Switch Replacement (TVSR)**	**$10,500,000**	**Various**	**C-05, M-08**

FAA Strategic Goals: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: As of FY 1994, over 70 percent of the voice switches in operation in the terminal environment were either the obsolete electromechanical or the aging analog switch installed from the 1960s through the 1980s. These older systems are unsupportable and replacement switches are required to ensure the continuation of effective air traffic control services. This program will replace these older switches with modern digital equipment and will significantly improve the operational and maintenance aspects of terminal operations. The acquisitions under this program also serve as the contract vehicles to provide equipment to new or modernized terminal facilities.

Description of Solution: This modernization program will replace the obsolete electromechanical and non-supportable electronic voice switch systems in terminal facilities. The terminal voice switch program consists of six major procurements: Small Tower Voice Switch (STVS) for small switches, Enhanced Terminal Voice Switch (ETVS), Rapid Deployment Voice Switch (RDVS) for large switches, Interim Voice Switch Replacement (IVSR), Conference Control System (CCS) and the Voice Switch By-Pass (VSBP). The STVS procurement was completed in FY 2002 with its last delivery in March 2002. The replacement of the conference control system consists of a single procurement for a new system at the Air Traffic Control System Command Center (ATCSCC), which went operational in October 2004. The VSBP is installed at terminal facilities to provide back-up access to selected radios. This contract expired in June 2007; a follow on contract was established. The ETVS and RDVS-IIA contracts were indefinite delivery/indefinite quantity (IDIQ) commercial off-the-shelf procurements. The ETVS contract was extended through June of 2007. The RDVS-IIA acquisition contract expired in December 2003, but systems for new facilities are in storage and installations continue. The IVSR contract was awarded in November 2004 and received an in-service decision in March 2007.

Prior year funding provided for the delivery of 457 voice switches, replacement of the air traffic control headsets in the terminal environment, and replacement of the conference control system at the ATCSCC. In FY 2007, $11,300,000 was appropriated to complete the in-service decision (ISD) activities on the IVSR contract. Sustainment activities continued on STVS, ETVS and RDVS voice switches that have been installed in the National Airspace System. The program office procured, tested, delivered, and installed 10 systems. In FY 2008, $11,800,000 was appropriated to procure, deliver, test, and install 10 terminal voice switches. The FAA plans to perform system upgrades to existing RDVS sites and system expansions for three other sites. Sustainment activities will continue on previously deployed voice switches (STVS, ETVS and RDVS). Also, $200,000 was requested for IOT&E and $300,000 for in-service engineering activities. In FY 2009, $7,900,000 was appropriated to procure, test, deliver, and install 10 terminal voice switches. An additional $500,000 was appropriated for in-service engineering.

For FY 2010, $10,000,000 is requested to procure, test, deliver, and install 10 terminal voice switches. An additional $500,000 is requested for in-service engineering.

Benefits: This program provides reliable voice communications in support of air traffic terminal operations. The reliability of communications from controller to controller and controllers and pilots is vital to a safe air traffic control system. By providing an essential element of FAA's communications network, this program will support the safety of our transportation system. Approximately $7,300,000 per year will be saved in operational costs by reducing the current annual maintenance cost for electromechanical switches, reducing annual depot support costs, and reducing man-year costs associated with greater reliability and inherent.

In-service engineering allows for immediate response to emerging technology solutions. Funding is needed for ongoing engineering support of all prototyping efforts.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	457	$244,817.3 [1]
FY 2009 Appropriated	10	8,400.0
FY 2010 Request	10	10,500.0
FY 2011-2014	---	0.0
Total	477	$263,717.3

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Voice Switch Procurement	---	$4,500.0
2. Technical Support	---	2,000.0
3. Program Management Support	---	1,725.0
4. Logistics and Testing Support	---	800.0
5. Information Security	---	200.0
6. Site Preparation	---	775.0
7. In Service Engineering	---	500.0
Total	Various	$10,500.0

[1] Includes $620,900 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999; and $30,730 reduction of FY 2001 funds pursuant to rescission contained in P.L. 106-544. Includes reduction pursuant to P.L. 108-7, February 20, 2003.

Budget Item:	Title:	Request:	Location:	CIP Item(s):
2B09	**NAS Facilities OSHA and Environmental Standards Compliance**	**$26,000,000**	**Various**	**F-13, M-39**

FAA Strategic Goals: Organizational Excellence -– Ensure the success of the FAA's mission through stronger leadership, a better trained and safer workforce, enhanced cost-control measures, and improved decision-making based on reliable data. Objective 1 – Implement human resource management practices to attract and retain a highly skilled, diverse workforce and provide employees a safe, positive work environment. Make the organization more effective with stronger leadership, increased commitment of individual workers to fulfill organization-wide goals, and a better prepared, better trained, safer, diverse workforce

Description of Problem: Non-compliance with federal, state, and local environmental, safety and health legal and other requirements imposes significant liabilities on the FAA in the form of interruptions to NAS operations, violations of binding agreements, lost work time and productivity, regulatory fines and sanctions, civil and criminal lawsuits, post-incident response actions, such as costly cleanups, and a decrease in employee morale. Recent examples of non-compliance events include a criminal investigation by the EPA over the improper management of asbestos containing materials at an Air Route Traffic Control Center (ARTCC) and multiple complaints of illnesses filed by FAA staff potentially exposed to molds and other air contaminants. Monthly, approximately 20 environmental, occupational safety and health (EOSH) events result in disruptions to National Airspace System (NAS) operations. Effectively managing environmental and safety risks and maintaining compliance requires the implementation of EOSH compliance programs to continually identify and assess risks, integrate risk reduction into system designs, implement controls and best management practices into daily operations, and maintain a workforce with the knowledge to identify and mitigate EOSH risks at their source.

Description of Solution: The program will provide funding required to implement nationally directed technical compliance programs designed to fully address federal, state, and local environmental and safety regulations and binding commitments. Within the Air Traffic Organization (ATO), the Environmental, Occupational Safety and Health (EOSH) Services group directs these programs in close collaboration with the Service Areas and Service Center.

For FY 2010, $26,000,000 is requested to continue the implementation of the following major EOSH programs:

The Fire Life Safety Program, which directly supports the FAA public safety mission and NAS capacity goals, through the integration of life safety systems requirements and the management and control of fire events and fire related incidents in FAA's critical NAS facilities, particularly Air Traffic Control Towers (ATCTs). Effective support and protection of a safe air traffic control environment is essential to limiting the impacts of fire, explosion, or related events to the flying public, FAA's employees, as well as NAS operations and facilities.

The Occupational Safety and Health (OSH) Compliance Program, which supports FAA's mission to promote and assure employee safety and health by ensuring FAA employees are properly prepared, equipped, protected, and/or trained. The OSH Compliance Program encompasses 27 unique technical program elements (such as asbestos, confined space, electrical safety, hazard communication, indoor air quality, radiation, and hearing conservation) to ensure the Agency meets all its occupational safety and health requirements.

The Environmental Compliance Program ensures operational readiness is not compromised by environmental compliance issues. It is designed to ensure compliance with federal, state, and local environmental regulations, and includes 20 individual technical programs elements such as air pollution control management, fuel storage tank compliance, National Environmental Policy Act (NEPA) compliance, and pesticides management.

The Incident Response Program, which supports FAA in assuring continued operation of the NAS and associated systems during emergency situations and supporting FAA response to such incidents.

The Requirements Integration Program (RIP), which ensures Energy, Environmental, Occupational Safety and Health requirements are integrated into new and existing NAS systems. Support FAA's mission to promote and assure workplace safety and health in the NAS by managing a compliant Job Hazard Analysis (JHA) or System Hazard Analysis for In-Service Equipment (SHAISE) program that assists the FAA in identifying potential/existing workplace hazards and recommended controls for hazards associated with maintaining systems in the NAS.

The Safety Integration Program provides communications between ATO and other FAA lines of business. These areas include the Occupational Safety and Health Administration (OSHA) Annual Report, ATO Safety Management Information System (SMIS) data management, reporting and trending, injury illness and assessment, Supervisor/Manager Training liaison, fire life safety unique to ATCTs, and coordination and dissemination of information across ATO.

The EOSH Training Program, which supports FAA's mission to promote and assure a safe and efficient NAS by managing a compliant EOSH Training program that uses training funds efficiently and reduces accident/Injury/Illness by providing for a properly EOSH-trained workforce.

The Inspection Program, which supports FAA's mission to promote and assure workplace safety and health in the NAS by managing an EOSH inspection program that effectively identifies workplace hazards, reduces and eliminates risk factors within the workplace, prevents injury/illness, efficiently use resources and complies with regulatory guidance.

Benefits: The primary benefit of the NAS Facilities OSHA and Environmental Standards Compliance Program is a safer and healthier workplace that is compliant with all environmental and safety requirements. This results in fewer disruptions to NAS operations, greater worker productivity and morale, and reduced likelihood for regulatory inspections, fines and citations. The most recent benefit-cost analysis conducted by EOSH Services demonstrated a Benefit to Cost Ratio of 2.2 to 1 and an internal rate of return (IRR) of 8.12 percent. ATO EOSH programs are expected to realize over $600 million dollars in benefits for the FAA (through avoided costs, Airline Direct Operating Costs, and Passenger Value of Time) over 10 years.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$422,289.4 [1]
FY 2009 Appropriated	---	26,000.0
FY 2010 Request	---	26,000.0
FY 2011-2014	---	104,000.0
Total	Various	$578,289.4

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Environmental and Occupational Safety and Health (EOSH) Compliance	---	$16,000.0
2. Fire Life Safety for ATCTs	---	10,000.0
Total	Various	$26,000.0

[1] Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B10	Airport Surveillance Radar (ASR-9)	$3,500,000	Various	S-03, M-25, M-08

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The Airport Surveillance Radar Model 9 (ASR-9) provides aircraft target and weather information to air traffic controllers, which help reduce delays and improve safety at high activity airports. The ASR-9 system was designed and deployed in the 1980s and 1990s, and was at risk of an increase in failures. As a result of these failures, reliability and performance levels have degraded, thus adversely impacting efficiency. Therefore a service life extension of the ASR-9 hardware is necessary to continue system operation, improve reliability and performance levels, and maintain the current level of safety.

1. ASR-9/Mode-S - Service Life Extension Program - Phase 1B Transmitter Mod ($1,400,000):

Description of Solution: The FAA developed a two-phased strategy to provide the 135 highest traffic airports aircraft surveillance services. Phase 1 immediately addresses the highest risk physical equipment repair and replacement in order to sustain operations. Phase 2 is a long-term strategy that will reduce overall service risk through 2025. This two-phased approach is more affordable and lowers risk.

Phase 1 was broken down into two elements, Phase 1A and Phase 1B. Phase 1A included; external antenna modifications to mitigate risk of structural collapse; replacement of the obsolete ASR-9 Remote Monitoring System (RMS) and Mode-S Maintenance Data Terminals (MDT) which mitigated technical obsolescence risk (unavailability of spare parts); and modifications to the waveguide and pedestal that addressed additional OSHA issues. The Joint Resources Council approved the investment required for performing the work under Phase 1A in September 2004. The last year of funding received for Phase 1A was in FY 2008.

Phase 1B consists of modifications to the ASR-9 transmitter to improve reliability and maintainability. A final investment decision for Phase 1B was obtained in June 2005.

In FY 2007, $14,800,000 was appropriated for Phase 1B activities. Under Phase 1B, $14,800,000 was used to complete development, test, and installation of first article transmitter modification; commence production of transmitter modification kits for 135 sites; and, begin implementation planning for the installation, testing, and acceptance of the production kits.

In FY 2008, $4,600,000 was appropriated to continue transmitter modification installations under Phase 1B.

In FY 2009, $3,300,000 was appropriated to continue Phase 1B transmitter modification installations.

For FY 2010, $1,400,000 is requested to complete Phase 1B transmitter modification installations.

Benefits: Terminal radar reduces delays and improves safety at congested airports. During instrument meteorological conditions the radar provides air traffic controllers, information that allows closer aircraft operations and increases air traffic arrival and departure operations. Modifying these radar systems reduces the risk of outages and ensures the continuation of maximum service capabilities during poor visibility, night time, and adverse local weather conditions. In addition, it reduces the overall lifecycle operation and maintenance cost of the systems.

2. ASR-9 SLEP Phase 2 ($1,000,000):

Description of Solution: The FAA developed a two-phased strategy to provide the 135 highest traffic airports aircraft surveillance services. Phase 1 immediately addresses the highest risk physical equipment repair and replacement in order to sustain operations. Phase 2 is a long-term strategy that will reduce overall service risk through 2025. This two-phased approach is more affordable and lowers risk.

Phase 2 consists of implementing additional modifications to the aging primary ASR-9 radar systems to sustain primary surveillance in terminal airspace through 2025. The sustainment of the ASR-9 aligns with the Next Generation Surveillance Roadmap Decision, and the ADS-B backup strategy.

In FY 2009, $4,300,000 was appropriated to complete the business case development, award a contract for design and development, and to procure and implement non-development items.

For FY 2010, $1,000,000 is requested to continue design and development testing, and begin implementation of the modifications.

Benefits: Terminal radar reduces delays and improves safety at congested airports. During instrument meteorological conditions the radar provides air traffic controller's information that allows closer aircraft operations and increases air traffic arrival and departure operations. Modifying these radar systems reduces the risk of outages and ensures the continuation of maximum service capabilities during poor visibility, night time, and adverse local weather conditions. In addition, it reduces the overall lifecycle operation and maintenance cost of the systems.

3. ASR-9 – Independent Operational Testing and Evaluation (IOT&E) ($200,000):

IOT&E provides the agency with independent assessments of operational readiness that are used to support in-service decisions. These in-service decisions allow nationwide deployment and operational use of the new systems and ensure that the associated operational/safety risk is minimized, and will reduce system lifecycle operations cost. In FY 2009 $300,000 was appropriated for IOT&E.

4. ASR-9 - In Service Engineering ($900,000):

In-service engineering allows for immediate response to emerging technology solutions. Funding is requested for ongoing engineering support of all prototyping efforts. In FY 2009 $900,000 was appropriated for in service engineering.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	Various	$1,008,831.8 [1]
FY 2009 Appropriated	---	8,800.0
FY 2010 Request	---	3,500.0
FY 2011-2014	---	0.0
Total	Various	$1,021,131.8

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Transmitter Modification Installations (Phase 1B)	---	$1,400.0
2. ASR-9 SLEP		1,000.0
3. In Service Engineering	---	900.0
4. Independent Operation Test and Evaluation	---	200.0
Total	Various	$3,500.0

[1] This funding includes the St. Louis Relocation Project and the Palm Springs Installation Project.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B11	**Terminal Digital Radar (ASR-11)**	**$12,600,000**	**Various**	**S-03**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: Radar is a critical part of the National Airspace System (NAS), which allows air traffic controllers to determine an aircraft's precise location. When radar information is supplemented with weather information, the FAA is able to provide an additional level of safety, especially during storms, to continue the safe, efficient and orderly operation of the NAS.

Many terminal areas are still using 20-30 year-old analog radars (ASR-7's, ASR-8's) and Air Traffic Control Beacon Interrogator (ATCBI) systems that have reached the end of their projected life-cycles. The FAA must replace these older surveillance systems to continue primary and secondary radar service. Furthermore, these older systems do not provide the digital surveillance data required for the operation of digital automation systems such as the Automated Radar Terminal System (ARTS) IIIE and Standard Terminal Automation Replacement System (STARS).

In addition, there is an obsolescence issue with the ASR-11. The Low Overhead Array Processors, which are used in the ASR-11 signal processors cabinet, are 1980's technology and no longer in production. Current processors and memory utilization of some of these processor cards run between 80-90 percent. There is no possibility for expansion using these cards and adding additional processor cards would require major software modification and re-coding.

1. Terminal Digital Radar (ASR-11) - ASR-7/ASR-8 Replacement, DOD Takeover ($8,200,000):

Description of Solution: The FAA and the Department of Defense (DoD) awarded a contract in 1996 for a single integrated digital primary and secondary radar system, the Airport Surveillance Radar, Model 11 (ASR-11). The program was originally scheduled to provide 112 ASR-11 radar systems for the FAA. In FY 2005, the FAA established an interim program baseline to deploy the ASR-11 radar system to 66 sites. The FAA completed an alternative analysis in FY 2006 and determined that additional systems would not be procured. There will be 38 analog ASR-8 radars that will remain in the NAS.

The ASR-11 radar system provides digital surveillance data for digital automation systems such as STARS and ARTS IIIE. The ASR-11 radar system replaces the aging infrastructure with new radar facilities, including advanced grounding and lightning protection systems, digital or fiber optic telecommunications, emergency backup power supplies, and enhanced physical security. The ASR-11 radar system also provides a six-level National Weather Service calibrated weather capability that is not available with existing (ASR-7 / ASR-8) radar systems.

Since July 2000, the FAA has conducted 110 site surveys, developed 84 site designs, contracted 64 facilities constructions, ordered 66 ASR-11 radar systems, and commissioned 42 systems through the end of May 2008.

In FY 2009, $11,400,000 was appropriated to procure 10 demolition and restorations and purchase depot spares, and continue deployment of the systems purchased in previous years. The program plans to commission nine systems.

For FY 2010, $8,200,000 is requested to procure 10 demolition and restorations and purchase the final set of depot spares, and continue deployment of the systems purchased in previous years. The program plans to commission two systems.

Benefits: The ASR-11 radar system offers significant performance improvements and efficiencies not presently available with the existing ASR-7/8 systems, specifically:

Six-level weather detection capability calibrated IAW NWS standards. The existing systems provide very limited weather and non-standard detection capability, with limited capability to distinguish between low-level intensity and higher-level intensity weather that is hazardous to aircraft. The 6-level weather data provided by the ASR-11 is presented on air traffic control displays, resulting in a significant improvement in controller and pilot situational awareness of weather in the proximity of the airport, thus reducing the number of weather- related accidents and resulting cost of fatalities, injuries and aircraft damage. Further, it allows the controller to route aircraft around weather in advance, which reduces delays in-flight caused by weather.

The ASR-11 requires less maintenance than existing radars through the use of extensive computer aided fault isolation capabilities and remote system monitoring and certification. Each ASR-7/8 needs weekly certification by the maintenance technician at the radar site, while the ASR-11 system can be remotely certified, without visiting the site. The resulting improvement in operational availability, due to the reduced number of occurrences and duration of outages, will reduce aircraft delays that result from these outages. The reduction in aircraft delays reduces costs to the airlines and flying public in the form of passenger value time and aircraft direct operation costs.

Digital surveillance inputs to digital automation systems. The existing systems are analog and cannot interface with digital automation systems without installation of a costly digitizer subsystem. The FAA's commitment to digital automation systems drives the need for digital radars, since inputs to the automation systems must be in a compatible digital format. Digital capability also allows remoting data over long distances, which enables combining of air traffic control missions.

The ASR-11 radar system's combines four separate radar systems (ASR-7, ASR-8, ATCBI-4, and ATCBI-5) into one system. Installation of the ASR-11 system reduces our total number of terminal radar configurations from the existing four systems to three (ASR-8, ASR-9 and ASR-11), reducing inventory-carrying costs and training requirements.

The ASR-11 radar system also supports the Homeland Defense security mission by providing digital radar coverage to fill gaps between established FAA high-altitude radars.

2. Terminal Digital Radar (ASR-11) - Technology Refresh ($4,400,000):

Description of Solution: The ASR-11 program is currently in the full deployment phase of the system lifecycle. The ASR-11 program has completed contractor Developmental Test and Evaluation (DT&E), FAA Operational Test and Evaluation (OT&E), and Independent Operational Test and Evaluation (IOT&E). At the completion of the testing, the system was deemed ready for operational deployment and the program achieved an In-Service Decision (ISD) in September 2003. As of May 2008, 42 sites are commissioned and operational in the National Airspace System (NAS). All 66 systems have been procured and the remaining 24 systems are scheduled to be deployed by September 2009.

The technical refresh effort was initiated in 2005 as a joint, FAA, Department of Defense (DoD) and Raytheon effort to address life cycle obsolescence risk as well as the known performance limitations associated with the existing Signal Data Processor (SDP) portion of the ASR-11 system. The SDP resides in the primary surveillance radar (PSR) portion of the ASR-11 system and performs the post radio frequency primary radar target and weather signal data processing. This information is used by the air traffic controller as primary target and weather data for use in aircraft separation. As part of the completion of the DoD funded development, the Tech Refresh is scheduled to complete in-plant integration and testing and on-site design test and evaluation (DTE) in 2008. Operational testing by the FAA Technical Center is scheduled for 2008. Following completion of testing, a National Change Proposal (NCP) will be processed to incorporate the technical refresh into the ASR-11 product baseline. This effort to develop, test and integrate the technical refresh into the product baseline is fully funded.

The technical refresh kits are planned to be retrofitted into all systems previously fielded with the SDP. The first two production retrofit kits were procured in FY 2008 with the balance of the 68 FAA retrofit kits being procured in FY 2009 through 2012, with installation completed in 2014.

In FY 2009, $5,700,000 was appropriated at the target level for the purchase of the initial 22 kits to commence deployment. The funding would be used to replace the obsolete COTS hardware cards within the signal data processing card rack with the technical refresh kits. The technical refresh reduces the number of processing cards from fourteen to three. The program plans to install eight kits.

For FY 2010, $4,400,000 is requested to procure 17 technical refresh retrofit modification kits and install 12 kits.

Benefits: The ASR-11 technical refresh program addresses identified ISD issues and outstanding action items associated with processing throughput and memory capacity issues with the existing Signal Data Processor (SDP), primary radar azimuth resolution, low Doppler weather performance, and false track performance.

In addition, the ASR-11 technical refresh program avoids a $32.2 million incremental increase to the O&M cost baseline by eliminating duplicative support costs associated with SDP life cycle depot and second level engineering support.

The ASR-11 technical refresh eliminates a high supportability risk for operational ASR-11 sites due to SDP processor throughput and memory limitations.

Finally, the ASR-11 technical refresh program provides a suitable platform to allow the ASR-11 system to mitigate operational impacts to existing ASR-11 facilities due to new wind turbine power generation facilities currently impacting operational ASR-11 sites.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	66	$678,144.0 [1]
FY 2009 Appropriated	---	17,100.0
FY 2010 Request	---	12,600.0 [2]
FY 2011-2014	---	16,300.0 [3]
Total	66	$724,144.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. System Engineering	---	$2,000.0
2. Program Management	---	580.0
3. Logistics Support	---	690.0
4. Site Construction	---	2,750.0
5. ASR – 7/8 Disposition	---	2,180.0
6. Tech Refresh	---	4,400.0
Total	Various	$12,600.0

[1] The FY 2001 appropriation total has been adjusted to reflect rescission amounts pursuant to: P.L. 106-554, FY 2001, P.L. 108-7, February 20, 2003, and P.L. 108-199, January 23, 2004.
[2] Requirements for technical refresh are under review. FY 2009 Tech Refresh funding is included.
[3] Business case for ASR-11 ASDP requirements is being prepared. FY 2010-2013 Tech Refresh funding is not included.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B12	Runway Status Lights (RWSL)	$117,300,000	Various	S-11, M-25

FAA Strategic Goals: Increased Safety -– To achieve the lowest possible accident rate and constantly improve safety. Objective 3 - Reduce the risk of runway incursions

Description of Problem: The FAA's Flight Plan performance goal is to reduce category A and B runway incursions to a rate of no more than 0.509 per million operations by FY 2008, 0.450 by 2010 and maintain or improve that rate through FY 2012. The FY 2004 reported number of A and B incursions, 28, represents a rate of .444 per million operations. FY 2005 runway incursion status reports showed 29 category A and B incursions, or .460 per million operations. FY 2006 runway incursion status reports showed 31 category A and B incursions, or .507 per million operations. This trend shows an increase rather than decrease in both numbers and rate. While the numbers are not statistically conclusive, their volatility suggests that additional efforts will be required to ensure that the Flight Plan performance target is achieved. The establishment of additional installations to accrue incremental RWSL functionality will contribute toward the accomplishment of the Flight Plan performance target.

Description of Solution: Runway Status Lights (RWSLs) act as stoplights on runways and taxiways, signaling when it is unsafe to enter, cross or begin takeoff on a runway. Located along the centerline of a runway or taxiway, Runway Entrance Lights (REL) and/or Takeoff Hold Lights (THL) will illuminate red when a runway is in use, notifying the pilot of a taxiing aircraft to either stop prior to crossing the runway, or yield to the aircraft landing or taking off. Most runway incursions are caused by pilot deviation. RWSLs are a vital layer of redundancy in runway safety and provide a back up and reinforcement of controller guidance.

An initial investment was approved at the Joint Resource Council in July 2007. Final investment analysis activities are in progress with an expected June 2008 decision to support a prime contract award in early summer 2008.

In FY 2009, $26,960,000 was appropriated to fund software design, development, and testing. It would also include construction and implementation activities at the key site. FAA plans to begin implementation activities at all other airports.

For FY 2010, $116,900,000 is requested to complete installation of the key site, implementation activities at all other airports to including site specific construction, design activities, and equipment procurement. Remaining funds will be used for systems engineering, logistic support activities, initial utilities services, second level engineering support, establish support systems as well as contractor support to the program office for the above mention activities. Also requested is $400,000 for Independent Operational Test and Evaluation.

Benefits: Implementation of RWSL will reduce the likelihood of runway incidents. Most accidents take place at takeoff or landing therefore, a reduction in runway incursions directly translates into avoided accidents. Current runway accident risk models indicate that even with ASDE-X and Airport Movement Area Safety System (AMASS), a residual risk remains. RWSL is expected to address a significant portion of the remaining risk. Preliminary cost-benefit data suggests a positive business case for deployment of RWSL to high-risk airports. Specifically, current runway accident risk models indicate a risk-based return on investment in RWSL deployment to 17 airports.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$14,713.8
FY 2009 Appropriated	---	26,960.0
FY 2010 Request	---	117,300.0
FY 2011-2014	---	97,300.0
Total	Various	$256,273.8

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. System Engineering	---	$6,968.3
2. Program Management	---	6,752.4
3. Installation	---	9,253.6
4. System Optimization	---	7,171.2
5. Implementation	---	5,688.1
6. Logistics and Documentation	---	4,209.6
7. Support Systems	---	2,320.6
8. Second Level Engineering	---	1,514.5
9. Hardware and Software	---	12,571.8
10. Construction	---	60,449.9
11 Independent Operational, Test and Evaluation	---	400.0
Total	Various	$117,300.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B13	National Airspace System Voice Switch (NVS)	$26,600,000	Various	C-05

FAA Strategic Goals: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The current switch infrastructure within the NAS consists of 17 different types of switches. Each type of switch has a different logistical support structure resulting in an extensive inventory of parts to support each system as well as an engineering workforce that is capable of maintaining each switch type. This infrastructure is aging with some switches being over 20 years old. These aging switches are experiencing obsolescence issues. This requires engineering analysis and modification of systems to continue to operate these systems. Also the systems, as they age, are experiencing increasing failures of parts and increasing site visits for repairs, resulting in higher maintenance costs.

Additionally, the current inventory of switches does not support the future ATC operations as outlined by NextGen. These switches cannot be networked to allow for the flexibility that will be needed for future NAS operations, to include dynamic re-sectorization, facility backup, and resource re-allocation.

Description of Solution: The NAS Voice Switch will support current and future Air Traffic Control (ATC) operations as envisioned by government and industry forecasters. Much of this focus has been on reducing the duplication of functions and costs currently existing among the many systems providing ATC communications. This is driven by the demand to reduce operating, maintenance, and technology refresh costs. In conjunction with current technologies, a common architecture platform is currently being analyzed to resolve these issues. In FY 2007, $500,000 was appropriated for initiating an investment analysis to begin the program. In FY 2008, $3,000,000 was appropriated for initial investment analysis activities and to support engineering efforts to develop architectural and preliminary "as-is" documentation and requirements definition. Also, efforts to develop documentation to support an updated procurement strategy based on prototype demonstrations. In FY 2009, $10,000,000 was appropriated to conduct vendor demonstrations, and to develop documentation for initial investment analysis activities.

For FY 2010, $26,500,000 is requested to complete the Initial Investment Analysis and to begin acquisition activities leading to for a Final Investment Decision. This decision will allow the NVS to move into the final investment analysis phase. NVS contract award to begin is planned for FY 2011. The NVS switch replacement program and the modification and development of the fully network capable switching platform. This will begin Segment 1 of the NVS program where the program office will begin replacing the old and aging switches. Also, in this phase of the program, modification and development of the network capabilities required in the switch will be developed, tested and prepared for deployment in the next phase to meet the NextGen vision.

The tasks to be completed in FY 2010 are:

- Complete vendor demonstrations
- Complete Initial Investment Analysis
- Prepare SIR package for NVS Conduct source selection
- Complete final program documentation for Release SIR package to industry for NVS Contract

An additional, $100,000 is requested for Independent Operational Test and Evaluation (IOT&E).

Benefits: The NAS Voice Switch program will allow FAA to achieve voice switching modernization objectives such as a network-based infrastructure as well as evolve toward a flexible communications routing architecture that supports dynamic re-sectorization, resource reallocation, airspace redesign and the NextGen vision (e.g., improving flow capacity).

The NAS Voice Switch program maps to the FAA goal of increased airport capacity to meet reductions in the projected operating costs by: reducing the number of equipment components needing to be inventoried, by reducing the number of switch types; reducing acquisition, training, and maintenance costs by reducing the number of voice-switch designs; improving equipment availability and related inventory issues by reducing obsolete equipment; and reducing potential costs to users from air traffic delays due to projected outages of the existing systems and increased user demand.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$3,500.0
FY 2009 Appropriated	---	10,000.0
FY 2010 Request	---	26,600.0
FY 2011-2014	---	200,000.0 [1]
Total	Various	$240,100.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Investment Analysis	---	$2,000.0
2. Engineering Analysis	---	2,500.0
3. SIR Preparation	---	2,500.0
4. Documentation	---	2,000.0
5. Contract Award	---	17,500.0
6. Independent Operational Test and Evaluation	---	100.0
Total	Various	$26,600.0

[1] Future requirement under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B14	**Next Generation Voice Recorder Replacement Program (VRRP)**	**$11,900,000**	**Various**	**C-23, M-08**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: FAA Order 7210.3 Facility Operation and Administration requires that ATC facilities "record operational communications to the maximum extent practicable." FAA Order 8020.11 and FAA Order 7210.56 require retention of data extraction records for accident and incident investigations. Recordings may be used to monitor any air traffic position for evaluation, training or quality control purposes and are to be available under requests made under the Freedom of Information Act. Voice recorders also are needed to support search and rescue activities. As the voice recorder technology has continued to evolve, early digital voice recorders have experienced obsolescence and supportability issues. These digital voice recorders are reaching the end of their service life utilizing obsolete operating systems and parts that have reached their end of life and are no longer manufactured. The remaining air traffic control analog voice recorders are beyond their expected service life and increasingly unreliable and expensive to maintain. Reduced availability critically impacts the detailed investigation of air traffic incidents and accidents. This reduced system availability impacts controller evaluation and training.

Description of Solution: The Next Generation Voice Recorder Replacement Program provides new voice recorders for en route and terminal ATC facilities. The program will replace obsolete and unsupportable digital voice recorders that have reached their 10-year end of life. The program will also provide the capability for new FAA facilities to procure voice recorder equipment and replace obsolete Dictaphone 9800 recorders in mobile air traffic control towers (MATCT). System deliveries of the next generation voice recorder replacement are planned through FY 2014. In FY 2008, $10,500,000 was appropriated for procurement, delivery and installation of 95 systems. In FY 2009, $10,300,000 was appropriated for procurement, delivery, and installation of 120 systems. An additional $500,000 was appropriated for in-service engineering.

For FY 2010, $11,400,000 is requested for procurement, delivery and installation of 121 systems. An additional $500,000 is requested for in-service engineering.

Benefits: The Next Generation Voice Recorder Replacement Program will support the safety goal, providing legal recording capability between air traffic controllers, pilots and ground-based air traffic facilities in all ATC domains. It will also be utilized in the investigation of accidents and incidents and routine evaluation of ATC operations to include operational errors and operational deviations. Additionally, the program will reduce O&M costs to sustain recorder systems.

In-service engineering allows for immediate response to emerging technology solutions. Funding is requested for ongoing engineering support of all prototyping efforts.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	95	$15,200.0 [1]
FY 2009 Appropriated	120	10,800.0
FY 2010 Request	121	11,900.0
FY 2011-2014	142	9,600.0
Total	478	$47,500.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Voice Recorder Procurement	120	$8,850.0
2. Program, Configuration, and Quality Management	---	1,166.0
3. Technical and Logistics Support	---	500.0
4. Second Level Engineering Support	---	550.0
5. Site Preparation and Implementation	---	334.0
6. In Service Engineering	---	500.0
Total	120	$11,900.0

[1] First year Next Generation Voice Recorder Replacement Program (NGVRRP) (C23.01-00) funds in FY 2006 and beyond are shown. FY 2006 funds of $4.7M were transferred to C23.01-00 from the original Voice Recorder Replacement Program (VRRP) (CIP C23.00-00) to separate the two baselines. This decision was finalized by Executive Council decision on 30 April 2007.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B15	Integrated Display Systems (IDS) Technology Refresh and Sustainment	$7,000,000	Various	A-03

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The Information Display System Version 4 (IDS-4) integrates several National Airspace System (NAS) weather sensors and operational data onto a single display platform. The information is used by several thousand air traffic controllers. The IDS-4 vendor recently notified the FAA of hardware and software obsolescence issues, making it unfeasible to continue long term sustainment of the IDS-4. The current IDS-4 system is one of the largest automation systems used by the air traffic control system and must be sustained in order to continue providing the same level of service to the flying community. These older systems are obsolete, becoming increasingly difficult to repair or maintain, and, cannot accept new functionality. Thus, the systems are unable to support future growth projections in capacity and demand for air traffic services. This is an operational risk to service. Because of this high risk, these systems need to be replaced and sustained in the very near future.

Description of Solution: Replace all aging IDS-4 systems through open competition within a six year period. During the first year, a replacement workstation solution will be designed and developed, produced in a limited quantity, and undergo factory, developmental, and operational testing. Following successful testing, production of workstations will begin and workstations will be installed at threat three support facilities. Organic maintenance support and 2nd level engineering support will also be established to support the new workstations. This will mitigate the immediate risk of a catastrophic failure as the older workstations are removed from the NAS and used to repair the legacy workstations. In subsequent years, IDS-4s will be replaced at a rate that supports the projected failure rate. This system will provide the stop gap necessary to provide the FAA time to develop and deploy the Terminal Flight Data Manager (TFDM) system as defined in the FAA Road Map. TFDM implementation is currently planned in the Road Map from 2015-2020.

In FY 2009, $7,000,000 was appropriated to complete the design, development and testing of the first article workstation; begin production and assembly of the workstations; complete developmental and operational testing; and, to install 16 workstations at the threat three support sites. The IDS-4s replaced will be sent to the Logistics Center to outfit the logistics stockpiles for these older computers to support remaining IDS-4 sites. The program sustains the new systems until the capability provided by these systems can be implemented as a part of the Terminal Flight Data Manager (TFDM) outlined in the Terminal Automation Roadmap.

For FY 2010, $7,000,000 is requested to procure and deploy replacement systems. Site sequence for deployment of the workstations will be based on traffic count. This will mitigate the risk to service at these sites, and serve to replenish the logistics inventory for these older system components to support the remaining IDS-4 sites until replaced.

Benefits: The Integrated Display System will replace IDS-4 systems with current technology. Replacement of these systems will mitigate the risk to service at these sites. Ensuring the system remains in service will help to sustain controller situational awareness by maintaining departure and arrival rates and providing more timely emergency response actions. Also, usable IDS-4 workstations will be sent to the Logistics Center to support the remaining IDS-4 systems until replacement can be accomplished.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$0.0
FY 2009 Appropriated	---	7,000.0
FY 2010 Request	---	7,000.0
FY 2011-2014	---	33,900.0
Total	Various	$47,900.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
IDS Technology Refresh and Sustainment	---	$7,000.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B16	**Integrated Terminal Weather System (ITWS)**	**$1,900,000**	**Various**	**W-07, M-25, M-31, M-39**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: Weather is the major contributor to air traffic delays, accounting for 65 percent of all delays, and 40 percent of accidents. Air traffic personnel in Air Traffic Control Tower (ATCT) cabs, Air Route Traffic Control Centers (ARTCCs), and Terminal Radar Approach Control (TRACON) facilities rely on a number of terminal area sensors that collectively provide large amounts of weather data. These data, which controllers manually interpret, may also be confusing. The main shortcoming of the present system is that it cannot anticipate short-term weather changes that affect capacity, safety, and efficiency in the terminal area, such as precipitation, ceiling, visibility, windshear, microbursts, gust fronts, winds aloft, tornado activity, and thunderstorms, nor the impact of these changes on terminal operations. There is a need to consolidate and provide value-added, timely, and accurate weather forecasts and special products to the aviation system users and operations community.

Description of Solution: The Integrated Terminal Weather System (ITWS) provides products to terminal aviation system users that characterize the current terminal weather situation and forecast anticipated weather conditions for the next 60 minutes. ITWS integrates data and products from various FAA and National Weather Service (NWS) sensors (i.e., Terminal Doppler Weather Radar (TDWR), Airport Surveillance Radar (ASR), Next Generation Weather Radar (NEXRAD), Low Level Windshear Alert System (LLWAS), Automated Surface Observing System (ASOS)), aircraft (via the Meteorological Data Collection and Reporting System (MDCRS)), and other NWS weather information systems. Products generated by ITWS include: windshear and microburst predictions, storm cell and lightning information, and terminal area winds aloft. The ITWS situation displays (SDs) at tower cabs, TRACONs, and their associated ARTCCs (Traffic Management Units and Center Weather Service Units) facilitates a common situational awareness of severe weather phenomena among air traffic control personnel. Data is also available to airlines and other airline industry users for their use in planning activities. In the future, ITWS will provide service remotely to 16 secondary/reliever airports.

In FY 2006, the program completed development and integration of Terminal Convective Weather Forecast (TCWF) and procured two TCWF-capable systems. The systems procured were the New York ITWS which was installed and tested in FY 2006 and the Memphis ITWS which began installation in FY 2006. To improve program cost efficiency and mitigate increasing technical obsolescence due to pending changes in manufacturers' commercial product lines, the program also procured the hardware for the remaining 9 of 26 TCWF-capable production systems and 11 TCWF retrofits. The program developed a plan for accelerating system deployments to the greatest extent possible in FY 2007 and FY 2008. The program began TCWF retrofit preparations, continued to fund the operation of the prototypes, and started activities to install production systems in FY 2007.

In FY 2007, $20,900,000 was appropriated to install and test seven TCWF-capable production systems and operationally commission four systems, completing replacement of the prototypes. ITWS completed installation of TCWF retrofits at all 11 previously installed non-TCWF production sites. The project also incorporated the TCWF enhancement into the Volpe National Transportation Systems Center (VNTSC) ITWS External User 2 website. This website allows additional FAA and non-FAA users access to ITWS products on a real-time basis. Additionally, technical support and transition to organic maintenance at delivered sites continued to be supported as well as IOT&E and in-service engineering activities.

In FY 2008, $13,200,000 was appropriated to install three systems and operationally commission seven systems, completing the original 22 operational systems and four support systems serving 36 airports. In

November 2007 the JRC approved the procurement of 11 of the 12 deferred sites and hardware for displays at 16 secondary/reliever airports. As a result, related site preparations and installations are scheduled to begin in FY 2008. Funding also provides for IOT&E and in-service engineering activities.

In FY 2009, $4,500,000 was appropriated to install eight ITWS Product Generators (PGs) and commission five ITWS PGs. Additionally, the communication lines and displays will be installed for the secondary/reliever airports. The appropriated funding will also provide for operational support of recently commissioned systems, and the addition of new systems sending weather information through the external user interface to Volpe, which provides ITWS products to authorized, external users such as the airlines. Funding will also provide for NextGen studies and concept demonstrations of potential weather capabilities and ITWS weather system integration initiatives as part of future NextGen and SWIM capabilities as well as in-service engineering activities. Initial software development of an ITWS SWIM gateway will be provided by the Volpe Center.

For FY 2010, $1,100,000 is requested to install the final three ITWS Product Generators (PGs) and commission the final six remaining ITWS PGs. This will complete the 33 operational systems acquisition program, providing advanced graphical weather information at 48 airports, 29 of which are OEP level. Installation of displays and communications to provide remote ITWS service to 16 additional secondary/reliever airports will also be completed in FY 2010. In addition $800,000 is requested for in-service engineering activities

Benefits: National Transportation Safety Board (NTSB) statistics indicate weather-related delays cost the aviation industry and the traveling public approximately $4.1 billion per year, of which $1.7 billion per year is considered avoidable. Weather is a direct contributor to 40 percent of all aviation accidents, 50 percent of all aviation fatalities, and accounts for 65 percent of system delays. Through improved integration of weather data into timely, accurate aviation weather information, FAA can reduce delays and improve NAS capacity utilization while enhancing aviation safety. The ITWS will integrate terminal weather data to automatically provide current weather information and predictions in easily understood graphic and textual form.

In-service engineering allows for immediate response to emerging technology solutions. Funding is requested for ongoing engineering support of all prototyping efforts.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	33	$353,170.6 [1]
FY 2009 Appropriated	---	4,500.0
FY 2010 Request	---	1,900.0
Baseline Requirement	---	6,000.0
Total	33	$365,570.6

[1] Of this amount, $49,300,000 was appropriated for the aviation weather products generator (AWPG) program, which was canceled in FY 1995. Additionally, $6,000,000 was appropriated for the aviation weather research program in FY 1996. Also, $3,000,000 was appropriated for phased array radar in FY 2001. Total non-ITWS funds $58,300,000. The appropriation amount also reflects a $359,400 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. Also includes $58,560 reduction of FY 2001 funds pursuant to rescission contained in P.L. 106 554. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Program Management	---	$73.1
2. Engineering	---	37.0
3. Telecommunications	---	54.0
4. NAS Implementation	---	200.9
5. Test and Evaluation	---	200.0
6. Program Support	---	535.0
7. In-Service Engineering	---	800.0
Total	Various	$1,900.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2B17	**Remote Maintenance Monitoring (RMM)**	**$1,000,000**	**Various**	**M-07**

FAA Strategic Goal: Organizational Excellence – Ensure the success of the FAA's mission through stronger leadership, a better trained and safer workforce, enhanced cost-control measures, and improved decision-making based on reliable data. Objective 3 - Improve financial management while delivering quality customer service.

Description of Problem: The RMM is the primary tool used by the FAA to maintain the operation of all National Airspace System (NAS) systems and facilities. RMMS consists of two main functions: (1) monitor and control of remote NAS systems and facilities; and (2) maintenance management of all NAS systems and facilities. The RMMS hardware platforms and software applications have been operating since the 1980's and are in need of Technology Refresh. Supportability of existing hardware platforms is cost prohibitive and the existing software applications are written in proprietary languages. In addition, due to the aging system, the reliability of the existing RMM is deteriorating.

Description of Solution: For FY 2010, $1,000,000 is requested for the Remote Monitoring and Logging System (RMLS) as follows:

- New RMLS NRN Server-Based Platforms. These server-based platforms will be installed in rack 1 of the existing RMLS NLN infrastructure located at the Operations Control Centers (OCCs).
- New RMLS NRN Protocol Converter Platforms. These platforms will be installed at the Air Route Traffic Control Centers (ARTCCs) to replace the existing MPS Tandem computers.
- Data Connectivity. FAA Telecommunications Infrastructure (FTI) will provide data connectivity from OCC to OCC, from OCC to ARTCC, and from ARTCC to OCC.

Benefits: RMLS NRN lifecycle is 12 years starting in FY 2010 and ending in FY 2021. When compared to maintaining the existing MPS over the same lifecycle the RMLS NRN provides the FAA a total cost avoidance benefit of $125.8 million.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$0.0
FY 2009 Appropriated	---	0.0
FY 2010 Request	---	1,000.0
FY 2011-2014	---	0.0
Total	Various	$1,000.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Planning/Development of RMLS Tech Refresh	---	$1,000.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2C01	**Automated Surface Observing System (ASOS)**	**$5,500,000**	**Various**	**W-01**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: Accurate, reliable weather information is an integral element in the safe and efficient use of the Nation's airspace. Surface weather observations are required by pilots for flight planning, takeoffs, and landings, by the National Weather Service for aviation weather forecasts, and by airline dispatchers and air traffic control personnel for air traffic control and flow management. Automated weather observing equipment improves the quality, frequency, and timeliness of weather observations, reduces costs, and reduces the period of time expended by air traffic controllers on weather observation duties. There is a continuing need for automated weather observing capabilities at many airports.

The ASOS P3I program contributes to extending the service life of the ASOS equipment to 2020. Several of the ASOS P3I efforts have addressed, or are addressing, obsolescence issues that would affect the ability of the ASOS equipment to produce weather observations in the near future. The ASOS P3I sensor efforts also will reduce system data outages and maintenance costs.

Description of Solution: The FAA has developed a long-range equipment strategy for improving automated surface weather observations. The eight weather systems that make up the Automated Surface Weather Observation Network (ASWON) program provide automated surface weather observations to meet the needs of pilots, operators, and air traffic personnel without incurring the high costs of labor-intensive manual surface weather observations.

Currently, the ASOS P3I program is the only ASWON program receiving Facilities and Equipment (F&E) funding. Three of the five ASOS P3I efforts have been completed (Processor Rehost and Dewpoint Sensor Replacement) or are near completion (451 of 571 Ice-Free Wind Sensors have been installed). The two remaining ASOS P3I efforts are currently underway. The sensor development and performance testing of the Enhanced Precipitation Identification (EPI) sensor have been completed, but the EPI sensor production has been delayed because the sensor did not meet all performance specifications. A follow-on development plan is being formed at this time. The Ceilometer Replacement development has started and is approximately 50 percent complete.

In FY 2008, $5,000,000 was appropriated to continue the EPI sensor for ASOS, to complete the Ceilometer Replacement development and operational acceptance testing, and to procure the first 250 ceilometers as part of the ASOS P3I program.

In FY 2009, $8,500,000 was appropriated to complete the EPI sensor development and operational acceptance testing and to procure the remaining 328 Ceilometers and spares as part of the ASOS P3I program.

For FY 2010, $5,500,000 is requested to procure the first 238 EPI sensors and to continue ceilometer installations as part of the ASOS P3I program.

Benefits: The principal benefits from implementing ASWON are the continued and expanded capability for Instrument Flight Rule (IFR) flight operations; improved continuous observation capability at a significantly reduced cost from manual observations; high quality, real-time weather data communication networks and one minute updates to weather parameters to provide for rapid observation of changing conditions and awareness of conditions impacting the efficient flow of air traffic.

More specifically, the ASOS provides departure/destination weather observations to maintain and increase capacity of Part 121 commercial aircraft and Part 135 Commuter/air taxi operations, as well as cloud ceiling information for towered and non-towered airports. Aircraft operations would be significantly affected by ASOS failures that cause missing weather observation data. The current ceilometer has been out of production since 1997 and the manufacturer only agreed to provide repair support through December 2007. The ASOS P3I Ceilometer Replacement effort will allow the ASOS to continue producing cloud ceiling reports through at least 2020.

The ASOS P3I program will provide $631.7 million estimated benefits from year 2007 through 2020 – Source: MCR Business Case Analysis (July 12, 2007) for ASWON JRC Review. The benefits identified in the analysis were the costs avoided by commercial aviation operations that would be caused by ASOS ceilometer failures or the lack of precipitation data if the ASOS EPI sensor was not available. The benefits are estimated to start in FY 2012. The ASOS equipment must continue to provide surface weather observations at least until 2020 when NextGen alternatives may begin to offer new services to a majority of the 571 FAA field sites.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	881	$375,837.1 [1]
FY 2009 Appropriated	---	8,500.0
FY 2010 Request	---	5,500.0
FY 2011-2014	---	9,200.0
Total	881	$399,037.1

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
ASOS – Pre-Planned Product Improvements	All systems	$5,500.0

[1] Includes $4,808,600 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. Includes FY 2001 rescission. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2C02	**Flight Service Station Modernization - Alaska Flight Service Modernization (AFSM)**	**$20,100,000**	**Various**	**F-05**

FAA Strategic Goals: Increased Safety -– To achieve the lowest possible accident rate and constantly improve safety. Objective 2 - Reduce the number of fatal accidents in general aviation.

Description of Problem: The Alaska Flight Service Modernization (AFSM) Mission Needs were approved in September 2006. By satisfying the below needs, increased business continuity will result. There are three areas of identified and approved needs:

1. Automation System: When the mission need was approved (Sept. 2006), there were three legacy systems in place. The NAS baselined system Model 1 Full Capacity (located only at the three Automated Flight Service Stations (AFSS) and two non-NAS baselined systems. The legacy systems had exceeded their useful lifecycle, were difficult to support and did not meet operational requirements of NAS-SR-1000, NAS System Requirements and FAA Order 7110.10, Flight Services. During the concepts and requirements definition (C&RD) Acquisition Management System (AMS) process, the non-NAS baselined automation systems experienced security issues and reports of lost data. To resolve the security issues and loss of data, the three legacy systems were replaced by the Operational and Supportability Implementation System (OASIS). The OASIS contract period of performance ends in February 2008. FAA General Counsel advised that the OASIS contract can only extend by a single source until February 2010. To accelerate implementation of the automation portion of the AFSM, the program has been segmented. Segment 1 is a one-for-one replacement of the automation system, the voice switch along with facilities and flight service delivery points will be included in Segment 2 of the AFSM program.

2. Voice Switch: The Voice Switches at the AFSSs do not provide capability to handle additional frequency capacity and flexibility. As a result, one AFSS cannot assume the frequencies of another AFSS in case of a catastrophic outage or for flexibility and operational efficiency of providing services. The voice switch will be included in Segment 2 of the AFSM program.

3. Flight Service Facilities: The Flight Service facilities in Alaska are old, suffer from structural and safety deficiencies and generally do not meet the American's with Disabilities Act (ADA) accessibility requirements as defined and imposed by HF-STD-001, HFDS, and addressed by FAA Order 9550.8, FAA Human Factors Policy. Facilities will be addressed in Segment 2 of the AFSM program. Until AFSM Segment 2 is approved for implementation, the facilities will be sustained and updated to meet EEOSH and ADA requirements.

Until the Facilities and Flight Service Delivery phase can be completed, FAA must provide a comfortable and safe working environment for employees. Funds are being requested as part of the Alaska Flight Service Modernization (AFSM) program to sustain Alaska's flight service facilities (3 Automated Flight Service Stations and 14 Flight Service Stations). Alaskan facilities have infrastructure deficiencies and require updating to meet ADA, OSHA and other local city and government codes and requirements. Existing heating, ventilation, and air conditioning (HVAC) systems fail to provide the proper environmental controls in operations, equipment, and administrative areas. In some cases, the existing HVAC systems re-circulate exhaust fumes from outside. Leaking roofs create water soaked areas – radically increasing the building mold spore count. Fire alarm systems require updating and evacuation routes/exits need to be modified to ensure safe egress. These conditions endanger personnel health and safety. Electrical upgrades and lightning protection are necessary to minimize the damage and frequency of power failures. Power failures directly affect flight service's ability to handle search and rescue efforts, provide pilot weather briefings, conduct in-flight communications, and receive and distribute weather and NAS information.

Description of Solution: The AFSM program addresses the following shortfalls: 1) automation system, 2) voice switches at the three AFSSs, and 3) facilities and flight service delivery points resulting in increased business continuity. The AFSM program has been segmented. Segment 1 – Automation received the Investment Analysis Readiness Decision in November 2007 for a one-for-one replacement of the current legacy (OASIS) automation system. AFSM automation received approval (January 2008) to combine initial Investment Analysis with final Investment Analysis and proceed to Final Investment Decision.

The AFSM Automation system will integrate weather graphics with text based weather and aeronautical information to provide pilot briefings. Automated weather, aeronautical and flight planning updates will be integrated with NOTAM and flight planning databases. A web portal will make data available to both FAA personnel and pilots, and will increase access to flight service information in most remote locations. Additionally, flight service buildings will be updated to meet OSHA and ADA requirements; building power, electrical and safety systems will be updated to meet current standards.

For FY 2010, $20,000,000 is requested to continue procurement and implementation activities of the AFSM automation system. Implementation activities include: site preparation, installation, testing and checkout, training, joint acceptance/inspection, and commissioning. The automation system will be installed at all 17 facilities. Ongoing system activities include: maintenance and infrastructure support, funding the new system and providing corrective software fixes and 56-day updates. Additionally funding is requested to comply with OSHA, and ADA, at the following locations Deadhorse, Northway and Homer, and ensure the power, electrical and safety systems meet current standards. Also requested is $100,000 for in-service engineering activities in support of the modernization program.

Benefits: The Alaska Flight Service Modernization program maps to the FAA Flight Plan goal of Increased Safety – Reduce accidents in Alaska. With greater service availability, the result will be increased safety to the general aviation community in Alaska and reduction in accidents.

Segment 1-Automation provides life-cycle support efficiencies of NAS-baselined programs and integrated/enhanced capabilities and functions.

Other benefits include:

- Modernization of the Automation system
- Expansion of situational awareness to improve efficiency
- Increased access for General Aviation users
- Reduced single points of failure
- Reduced operational costs

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982 – 2008)	---	$424,889.8
FY 2009 Appropriated	---	14,600.0
FY 2010 Request	---	20,100.0
FY 2011-2014	---	49,800.0
Total	1	$509,389.8

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Program Management	---	$3,000.0
2. Systems Engineering Management	---	8,100.0
4. Physical Infrastructure	---	1,000.0
5. Infrastructure Support	---	2,100.0
6. In-Service Management	---	5,800.0
7. In-Service Engineering	---	100.0
Total	1	$20,100.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2C03	Weather Camera Program	$3,800,000	1	M-08

FAA Strategic Goals: Increased Safety -– To achieve the lowest possible accident rate and constantly improve safety. Objective 2 - Reduce the number of fatal accidents in general aviation

Description of Problem: In the state of Alaska, flying is equivalent to driving in the continental US (CONUS). Alaska's skyways are equivalent to the road infrastructure found throughout the CONUS making the use of small aircraft essential to everyday life. Many times flying is the only means to get children to and from school activities; to transport service providers such as clergy, doctors, dentists, and nurses; to deliver patients to medical facilities; and to supply the communities with groceries, fuel, and mail.

The combination of many pilots and extreme flying conditions has resulted in a much higher accident rate in Alaska. According to the National Institute for Occupational Safety and Health, a disproportionate number of all U.S. aircraft crashes occur in Alaska. Between 1990 and 2006, there were 1,497 commuter and air taxi crashes in the United States of which 520 occurred in Alaska – 35 percent of all commuter and air taxi crashes.

Deficient weather information in Alaska contributes to a higher risk of accidents and flight inefficiencies. Without weather information about their destination airport and route of flight, pilots cannot make informed decisions on whether it is safe to fly or continue their flight. This leads to accidents and unnecessary fuel costs. The effective use of automated weather systems is limited and costly. In November 1995, the NTSB's Safety Study on Aviation Safety in Alaska recommended that FAA assist the National Weather Service (NWS) with an evaluation of the technical feasibility and aviation safety benefits of remote color video weather observing systems in Alaska. A need for pictorial views of current weather conditions accessible to the aviation community was established.

Description of Solution: For FY 2010 $3,800,000 is requested to improve safety and efficiency by providing weather visibility information in the form of near real-time camera images to aviation users. Low cost, commercially available, off-the-shelf cameras are installed at airports and en route locations. Camera images, updated every 10 minutes, are provided to the pilot and flight service station specialist for enhanced situational awareness, preflight planning and en route weather information about their destination airport and route of flight. Pilots are able to make more informed decisions on whether it is safe to fly before they are airborne and whether to continue their flight. This prevents accidents and avoids unnecessary fuel costs.

Benefits: Weather cameras are extremely beneficial in areas with rapidly changing terrain, weather phenomena, and as information about the safety Alaska airports and mountain passes. Weather cameras allow pilots to have weather information about their destination airport and route of flight. Pilots are able to make more informed decisions on whether it is safe to fly before they are airborne and whether to continue flight. This prevents accidents and avoids unnecessary fuel costs. Preliminary benefit data indicates weather cameras reduce 25 percent of weather related accidents within 25 miles of a weather camera sites. The continued expansion of weather cameras across the state of Alaska will help ensure FAA's safety goals are successful. Weather cameras have been identified as a specific initiative in the FAA's Flight Plan Increased Safety Goal for decreasing the number of general aviation aircraft accidents in Alaska.

The Weather Camera Program will contribute to this performance target by reducing a subset of Alaska accidents from a 2007 baseline of .28 accidents per 100,000 operations to:

FY 2009 - .22 accidents per 100,000 operations
FY 2010 - .20 accidents per 100,000 operations
FY 2011 - .18 accidents per 100,000 operations
FY 2012 - .17 accidents per 100,000 operations
FY 2013 - .16 accidents per 100,000 operations
FY 2014 - .15 accidents per 100,000 operations

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	74	$23,300.0 [1]
FY 2009 Appropriated	10	2,000.0
FY 2010 Request	10	3,800.0
FY 2011-2014	---	18,600.0 [2]
Total	94	$47,700.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Alaska Weather Cameras	10	$3,800.0

[1] Includes reduction pursuant to P.L. 108-199, January 23, 2004. Only prior year funds that were appropriated under Safe Flight 21, item 1A02 for Weather Cameras are reflected here. Prior year funds under 1A01 for the expansion of ADS-B are shown under item 1A10.

[2] Future requirement are under review.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2D01	**Very High Frequency Omnidirectional Range (VOR) with Distance Measuring Equipment (DME)**	**$5,000,000**	**Various**	**N-06**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The Very High Frequency Omnidirectional Range (VOR) with Distance Measuring Equipment (VOR/DME) is a ground-based electronic system that provides azimuth information to aircraft. When VOR/DME signal transmission deterioration occurs due to site encroachment such as tree growth, construction of bridges, buildings, etc., it is necessary to restore these facilities to their full service volume. Tactical Air Navigation (TACAN) Antennas provide azimuth and distance information for military aircraft and distance information for commercial aircraft. The TACAN system sustainment is needed to allow continued access to En Route and Terminal approaches. The equipment at most of these sites is over 35 years old, which is beyond the originally estimated service life.

Description of Solution: This program replaces, relocates, converts and modifies Very High Frequency Omnidirectional Range (VOR) facilities (including Very High Frequency Omnidirectional Range (VOR) with Distance Measuring Equipment (VOR/DME) to improve the VOR performance. This program also provides for the continued field installation of approximately 100 remaining low-power Tactical Air Navigation (TACAN) antenna retrofit kits that were procured with prior year funds.

In FY 2008, $5,000,000 was appropriated to convert/relocate VOR/DME facilities and continue necessary sustainment implementation efforts for those systems that are no longer operational or supportable due to life-cycle issues.

In FY 2009, $7,500,000 was appropriated to fund engineering and technical services support; begin new acquisition activities, convert approximately five VOR/DME facilities; relocate two VOR/DME; and continue necessary sustainment implementation efforts for those systems that are no longer operational or supportable due to life-cycle issues. This funding will help to mitigate the risk of isolated capability gaps throughout the National Airspace System.

For FY 2010, $5,000,000 is requested to fund engineering and technical services support; begin new acquisition activities, convert approximately three VOR/DME facilities; relocate one VOR/DME; and continue necessary sustainment implementation efforts for those systems that are no longer operational or supportable due to life-cycle issues. This funding will help to mitigate the risk of isolated capability gaps throughout the National Airspace System.

Benefits: The Very High Frequency Omnidirectional Range (VOR) with Distance Measuring Equipment (VOR/DME) program maps to the Federal Aviation Administration (FAA) goal of Reduced Congestion by making air traffic flow more efficiently over land and sea. The replacement, relocation, conversion, or modification of VOR facilities will enable FAA to maintain a highly reliable, safe, and efficient ground based VOR, VOR/DME, and Tactical Air Navigation (TACAN) systems until the use of Global Positioning System is widespread. The improved availability of this program provides enhanced aircraft routing and increased airport capacity.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$244,914.4 [1]
FY 2009 Appropriated	---	7,500.0
FY 2010 Request	---	5,000.0
FY 2011-2014	---	15,000.0
Total	Various	$272,414.4

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. New Acquisition Activities	---	$800.0
2. Relocate VOR Facilities	---	2,000.0
3. Convert VOR/DME Facilities	---	1,200.0
4. Logistics/Engineering Support	---	400.0
5. In Service Engineering	---	600.0
Total	Various	$5,000.0

[1] Includes $970,100 reduction of the FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. The FY 2001 appropriation has been adjusted to reflect the rescission pursuant to P.L. 106-554. Includes reduction pursuant to P.L.108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2D02	**Instrument Landing System (ILS) – Establish/Sustain**	**$8,600,000**	**Various**	**N-03**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: An ILS provides electronic guidance to pilots for safe aircraft landing during inclement weather and reduced visibility. The system includes a localizer, which gives lateral guidance to the runway centerline, a glide slope or landing beam to give vertical guidance, and marker beacons to show the aircraft progress as it approaches the landing field. The ILS sends information to instruments in the cockpit so that the pilot can maintain a perfect flight path to the runway even in low visibility. Some planes are equipped with an autopilot, which can directly receive ILS signals to automatically guide the plane to a landing.

Approach lighting and other equipment such as distance measuring equipment (DME), approach lighting systems (ALS), runway visual range (RVR) indicators, and non directional beacons (NDB) are part of the ILS approach and also aid the pilot in landing.

There are three categories of ILS. The lowest altitude at which a pilot is able to decide whether to land or abort (decision height) and how far the pilot can see the runway (runway visual range) defines each category.

- Category I: Decision Height (DH) 200 feet and Runway Visual Range (RVR) 2,400 feet (with touchdown zone and centerline lighting, RVR 1,800 feet);
- Category II: DH 100 feet and RVR 1,200 feet;
- Category IIIa: No DH or DH below 100 feet and RVR not less than 700 feet;
- Category IIIb: No DH or DH below 50 feet and RVR less than 700 feet but not less than 150 feet; and
- Category IIIc: No DH and no RVR limitation, requires an autopilot.

Approximately 1,200 runway ends are equipped with an ILS in the U.S. Of these, approximately 125 are more than 25 years old and must be replaced because they have exceeded their expected service life and their original manufacturer no longer provides support. Furthermore, FAA receives funding to purchase additional systems but until recently, received little money for site preparation and installation. Site conditions can affect ILS component performance so FAA must select ILS sites carefully. Large buildings or hangars can affect localizer signals and uneven terrain distorts glide slope signals. Once a site is selected, FAA must rectify any environmental impacts. Installers must also dig trenches to install electrical cable and communication lines. All of this construction work adds considerably to the cost of providing ILS service.

The FAA is aggressively pursuing implementation of satellite navigation but until that transition is complete, ILS remains the world standard for providing approach and landing services. In the next decade, more than 700 currently deployed ILS will exceed their service life. Many of these will have to be replaced.

Description of Solution: This program procures, installs, and replaces ILS's with a grouping of electronic devices (i.e., localizers, glides slopes, Approach Lighting Systems (ALS), and other ancillary aids). It provides a precision approach capability for landing aircraft with precise electronic guidance and visual aid information. This precision approach capability allows aircraft to land in weather conditions that would otherwise be prohibited, and enable airports to meet increasing traffic demands.

In FY 2008, $15,094,000 was appropriated to fund engineering and technical services support; provide incremental implementation funding for on-going establish/sustain ILS projects; and continue acquisition and implementation activities to increase operational availability.

In FY 2009, $9,050,000 was appropriated to fund engineering and technical services support; provide incremental implementation funding for on-going ILS projects; and continue acquisition and implementation activities to increase operational availability for approximately 10 Category I/II/III ILS approaches.

Also in FY 2009, $11,994,000 was appropriated under the American Recovery and Reinvestment Act (ARRA) to award the following construction contracts; Atlanta, GA - Establish ALSF-2; Decatur, AL - Establish LOC, GS, and DME; Winder, GA - Establish MALSR; Leesburg, VA - Establish GS; Swainsboro GA - Install GS; and Boise, ID - CAT II/III, ALSF-2.

For FY 2010, $8,600,000 is requested to fund engineering and technical services support; provide incremental implementation funding for on-going ILS projects; and continue acquisition and implementation activities to increase operational availability for Category I/II/III ILS approaches". This includes procuring five ILS systems, attaining service availability (establish) for three ILS locations and attaining service availability (upgrade) for four ILS locations".

Full implementation of satellite navigation and large-scale equipment decommissioning is decades away. In the meantime, the NAS continues to expand and users demand increased capacity, particularly in low visibility conditions. To do so, FAA must replace aging equipment and ensure that new equipment is installed correctly.

Benefits: The ILS program maps to the FAA goal of Greater Capacity by increasing airport capacity to meet projected demand and reduce congestion. The ILS provides both vertical and horizontal guidance information to the pilot to allow safe landings to touchdown and rollout.

The approach lighting provides the necessary visual cues for the pilot to safely land an aircraft when conducting an instrument approach. The ILS along with required approach lighting systems directly impact both system safety and capacity. This program provides the aircraft the ability to land in Instrument Meteorological Conditions, which increases the capacity to runways with ILS precision approach equipment. Weather-caused flight disruptions delays, diversions, over-flights, and cancellations impose economic penalties on both aircraft operators and users. A precision approach capability allows an airport to remain open to traffic when it would otherwise have closed thereby avoiding weather caused flight delays.

Establishment of new ILS's and replacement of aging ILS equipment will improve reliability and availability, therefore reducing the outage rate and the maintenance man-hours. Moreover, the ability to land aircraft in Instrument Meteorological Conditions (IMC) allows increased capacity to runways equipment with ILS precision approach and greatly improves Air Traffic Controller's workload.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$532,694.0 [1]
FY 2009 Appropriated	---	9,050.0
FY 2009 American Recovery and Reinvestment Act	---	11,994.0
FY 2010 Request	---	8,600.0
FY 2011-2014	---	28,600.0 [2]
Total	Various	$590,938.0

[1] Includes $24,000,000 appropriated in FY 1999 and $18,000,000 appropriated in FY 2000 under "Next Generation Landing Systems". Includes $340,400 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. The FY 2001 appropriation has been adjusted to reflect the rescission amount pursuant to P.L. 106-554. Includes $2,727,087 reduction of the FY 2001 funds pursuant to rescission P.L. 107-87, December 18, 2001. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.
[2] Future requirements will be based on activity levels and local situations that are validated on a year-to-year basis.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Procure/Install/Sustain CAT I/II/III ILS's	---	$7,000.0
2. Logistics/Engineering Support	---	1,600.0
Total	Various	$8,600.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2D03	**Wide Area Augmentation System (WAAS) for GPS**	**$97,400,000**	**Various**	**N-12**

FAA Strategic Goals: Increased Safety – To achieve the lowest possible accident rate and constantly improve safety. Objective 2 - Reduce the number of fatal accidents in general aviation.

Description of Problem: Many of the aircraft flying in the NAS lack seamless navigation capability and many runways in the NAS lack navigation aids that deliver stable vertical guidance in all weather conditions. The FAA provides vertically guided navigation to less than 18 percent of all public use runway ends in the NAS. FAA cannot afford to provide horizontal and vertical navigation for precision approach operations for all runway ends using ground-based navigation equipment such as the Instrument Landing System (ILS).

Similarly, proposed expansion of the NextGen airspace system requires precise Position Navigation and Timing (PNT) satellite navigation capabilities to facilitate access to more airports and runways.

1. Wide Area Augmentation System (WAAS) for GPS ($88,000,000):

Description of Solution: WAAS, a satellite based navigation technology allows any qualifying airport in the NAS to have vertical and horizontal guidance without expensive legacy navigation hardware installed at each runway. WAAS increases safety and enhances capacity in the NAS at a reduced lower cost than all other alternatives. WAAS continuously broadcasts a GPS-like signal in space for horizontal and vertical navigation across the NAS. WAAS consists of a network of 38 precisely surveyed ground reference stations that monitor the global positioning system (GPS) satellite signals. The ground reference stations are distributed across the continental United States and Alaska at FAA facilities. Three master stations collect the reference station data and calculate corrections and integrity messages for each GPS satellite. The WAAS messages are broadcast to user receivers via leased navigation transponders on two commercial geostationary (GEO) satellites. The user receiver on the aircraft applies the corrections and integrity information from the WAAS message to obtain the precise navigation service. Today, WAAS users can conduct en route operations over 100 percent of the NAS. In addition, they can conduct precision approach operations to qualifying airports throughout 95 percent of the 48 contiguous states without the requirement of conventional ground based navigation hardware.

WAAS is also currently supporting early opportunities for many of the NextGen capabilities. Early operational opportunities identify those users and applications of WAAS enabled navigation services that support proposed NextGen operational capabilities and concepts of operations to be used within the near term period of 2010 to 2015. Early operational opportunities represent a goal for expediting NextGen applications. The primary opportunities are in the RNAV and RNP areas of developing satellite-based navigation routes and terminal operations to improve safety, enhance efficiencies and minimize environmental impacts.

For FY 2010, $88,000,000 is requested to address ground system sustainment, satellite costs, and avionics development. FAA is continuing to develop WAAS to expand the precise horizontal and vertical guidance capability to 100 percent of the 48 contiguous states and to most of Alaska. This request includes activities essential to sustainment of the WAAS system. FY 2010 is the second year requesting funds specifically allocated to technology refresh which includes subsystem replacement and communication upgrades. WAAS is a Commercial Off-the-Shelf (COTS) based system. The baseline architecture requires an ongoing hardware and software refresh involving evaluation of component reliability and obsolescence, determination of replacement components, hardware and software development, and integration and test into the overall system. The total cost of technology refresh activities is $11,680,000 in FY 2010.

This request includes $39,680,000 for satellite lease costs, ground uplink lease services, and GEO development. NAS implementation activities, totaling $19,160,000, is comprised of flight standards support, WAAS procedure development, flight inspection, international coordination, and avionics standards development for dual frequency capability and new air traffic applications for WAAS. Technology evolution, $4,080,000, is requested for Stanford University, Boston College and Jet Propulsion Laboratory. These institutions will perform threat model assessments, conduct ionospheric analysis in support of WAAS and conduct safety analyses to support WAAS integrity. Technical Engineering and Program support, $13,400,000, is requested to support the WAAS program hardware and software development and installation. Review avionics engineering documentation and support next GEO development.

Benefits: The WAAS program maps to the FAA goals of Increased Safety and Increased Capacity. WAAS is the first navigation aid capable of providing vertical guidance, or three dimensional guided instrument approaches, to pilots during all phases of flight, in all weather conditions at all locations throughout the NAS. WAAS increases the availability of vertical guidance to all aviation operations. WAAS reduces accidents and saves lives (Flight Safety Foundation Report shows that reliable, accurate vertical guidance can reduce landing accidents by seven-fold). WAAS increases airport capacity. A highly accurate and reliable navigation signal available throughout the NAS to all aircraft is a capacity multiplier. The WAAS investment increases the availability of highly accurate and reliable horizontal and vertical navigation to all users.

By increasing procedures and expanding WAAS coverage, customers will equip with WAAS receivers and increase the total benefit realized by WAAS. It is estimated that several tens of million WAAS enabled receivers have been sold for non-aviation purposes with no encouragement from the FAA to non-aviation industries such as maritime, surveying, recreation and agriculture.

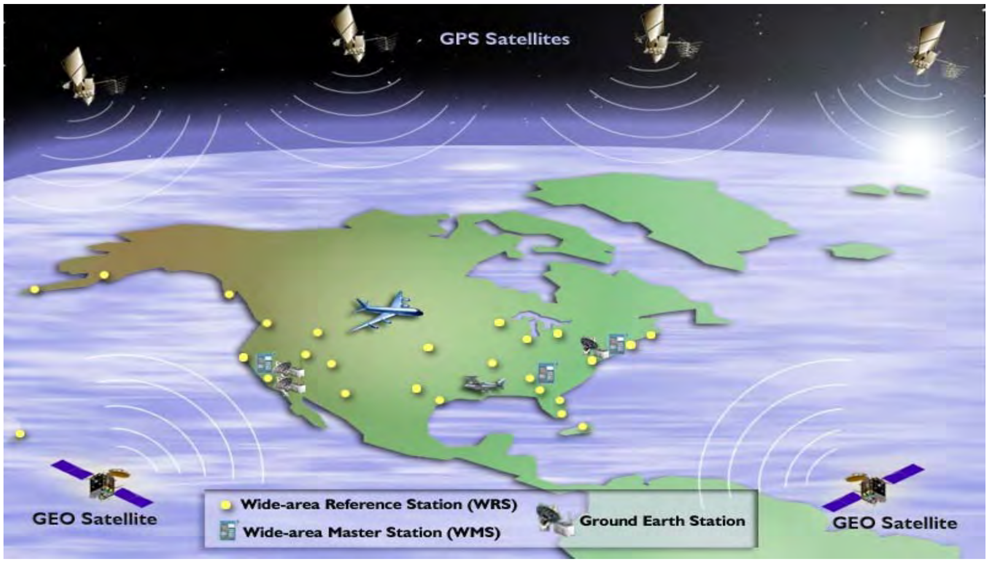
WAAS will reach over $209 million in safety benefits and $5.7 billion in efficiency benefits over the program life-cycle. Benefits of $177 million for VOR are realized by WAAS enabling reduction or avoidance of these expensive and high maintenance cost ground based navigation aids. These benefits are accrued over the life cycle and are in undiscounted constant year dollars for FY 2008.

Reductions in the number of ground based navigation aids and the associated cost savings are expected to. begin in 2010. A minimum operating network of ground based navigation aids will be retained. WAAS enables feeder airports to have reliable landing capability in all weather conditions, permitting feeder airports to establish scheduled transport operations and unloading major hub airports during bad weather. Airports can also exploit WAAS's inherent flexibility of providing vertical guidance at both runway ends for any runway to maintain or increase arrivals depending on changing traffic and weather conditions.

2. WAAS Survey and Procedures Acceleration ($9,400,000):

Description of Solution: For FY 2010, $9,400,000 is requested for WAAS Procedures for new surveys and accelerated procedural development for additional runways. The customer acceptance and benefit portion of the WAAS program includes all the activities that will make WAAS readily available and usable to FAA customers. FY 2009 funding will be used to increase the number of precision approach procedures developed and published at selected airports to facilitate increased user acceptance of WAAS.

WAAS enables feeder airports to have reliable landing capability in all weather conditions, permitting feeder airports to establish scheduled transport operations and unloading major hub airports during bad weather. Airports can also exploit WAAS's inherent flexibility of providing vertical guidance at both runway ends for any runway to maintain or increase arrivals depending on changing traffic and weather conditions.



In FY 2009, $15,000,000 was appropriated for procedure development ($5,000,000 is for WAAS Procedures and $10,000,000 is for new surveys). The customer acceptance and benefit portion of the WAAS program includes all the activities that will make WAAS readily available and usable to FAA customers. FY 2009 funding will be used to increase the number of precision approach procedures developed and published at selected airports to facilitate increased user acceptance of WAAS. In addition, FAA will initiate partnerships with avionics manufacturers, aircraft manufacturers, airlines and selected airports to create an environment that will enable the FAA customers to build their own business cases to equip and use WAAS for navigation. Standards to accommodate new capabilities unique to WAAS, including curved approaches and helicopter instrument approaches will be developed, and on-going data collection and analysis of procedures will be conducted. This activity including outreach, coordinating and promoting procedure development, working with avionics developers and airframe manufacturers to facilitate equipage, standards development, and procedure data collection in FY 2009.

Benefits: The WAAS program maps to the FAA goals of Increased Safety and Increased Capacity. WAAS is the first navigation aid capable of providing vertical guidance, or three dimensional guided instrument approaches, to pilots during all phases of flight, in all weather conditions at all locations throughout the NAS. WAAS increases the availability of vertical guidance to all aviation operations. WAAS reduces accidents and saves lives (Flight Safety Foundation Report shows that reliable, accurate vertical guidance can reduce landing accidents by seven-fold). WAAS increases airport capacity. A highly accurate and reliable navigation signal available throughout the NAS to all aircraft is a capacity multiplier. The WAAS investment increases the availability of highly accurate and reliable horizontal and vertical navigation to all users.

By increasing procedures and expanding WAAS coverage, customers will equip with WAAS receivers and increase the total benefit realized by WAAS. It is estimated that several million WAAS enabled receivers have been sold for non-aviation purposes with no encouragement from the FAA to non-aviation industries such as maritime, surveying, recreation and agriculture. WAAS will reach over $315 million in safety benefits and $3.2 billion in efficiency benefits over the program life-cycle. Benefits of $495 million are realized by WAAS enabling reduction or avoidance of the expensive and high maintenance cost ground based navigation aids. Reductions in the number of ground based navigation aids and the associated cost savings are expected to begin in 2010. A minimum operating network of ground based navigation aids will be retained.

WAAS enables feeder airports to have reliable landing capability in all weather conditions, permitting feeder airports to establish scheduled transport operations and unloading major hub airports during bad weather. Airports can also exploit WAAS's inherent flexibility of providing vertical guidance at both runway ends for any runway to maintain or increase arrivals depending on changing traffic and weather conditions.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	Various	$1,348,168.8 [1]
FY 2009 Appropriated	---	91,656.0
FY 2010 Request	---	97,400.0
Baseline Requirement	---	1,611,000.0 [2]
Total	Various	$3,148,224.8

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Technology Refresh and Equipment Replacement	---	$11,680.0
2. GEO Satellite and Development	---	39,680.0
3. NAS Implementation	---	19,160.0
4. Technology Evolution	---	4,080.0
5. Technical Engineering and Program Support	---	13,400.0
6. Accelerate Procedural Development	---	9,400.0
Total	Various	$97,400.0

[1] Includes reduction pursuant to P.L. 108-199, January 23, 2004. Also includes FY 2003/2004 approved reprogramming.
[2] LPV Segment Only

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2D04	**Runway Visual Range (RVR)**	**$5,000,000**	**Various**	**N-08**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The RVR provides air traffic controllers and pilots with critical meteorological visibility data that is used to allow take offs or landings during limited visibility conditions. Approximately 20 percent of all RVR systems in the NAS exceed their 20 years of Economic Service Life (ESL). Consequently, there is an increasing likelihood of loss of service due to life-cycle issues associated with the older RVR systems currently in the NAS. Furthermore, the older RVR equipment is mounted on rigid structures. If struck accidentally during departure or landing, severe damage to aircraft and possible loss of life could result.

Description of Solution: The older RVR systems are being replaced with new-generation RVR equipment that will eliminate the emerging life-cycle issues (i.e., Reliability, Availability, and Maintainability) associated with the older RVR systems currently in the NAS. Furthermore, the new-generation RVR equipment is mounted on frangible, low-impact-resistant structures that break away if struck by aircraft during takeoff or landing.

In FY 2008, $5,000,000 was appropriated for engineering and technical services/support; procurement of 14 RVR systems; final incremental funding for on-going RVR installation projects; and initial funding for nine new RVR installation projects.

In FY 2009, $5,000,000 was appropriated for engineering and technical services/support; procurement of nine RVR systems; final incremental funding for on-going RVR installation projects; and initial funding for six new RVR installation projects.

For FY 2010, $5,000,000 is requested for engineering and technical services/support; procurement of seven RVR systems; final incremental funding for on-going RVR installation projects; and initial funding for nine new RVR installation projects.

Benefits: The two main areas from which cost savings can be expected are:

- Reduced Flight Disruption: Weather caused flight disruptions – delays, diversions, over-flights and cancellations – impose economic penalties on both aircraft operators and users. Favorable RVR information is required to land during category II, III and many category I precision approaches. This allows an airport to remain open to traffic when it would otherwise have closed, avoiding weather-caused flight disruptions. These benefits are calculated by estimating the number of flight disruptions avoided multiplied by the unit cost for a flight disruption. The unit cost for a flight disruption is based on assumed operating scenarios that describe the flow of events when a flight is disrupted.

- Improved Safety: The benefit realized is the reduction or elimination of facilities and costs associated with aircraft accidents involving low-impact resistant structures versus aircraft accidents involving rigid approach structures. Use of low-impact-resistant structures reduces fatalities and the severity of damage to aircraft that accidentally strike these structures during departure or landing.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$136,200.7 [1]
FY 2009 Appropriated	---	5,000.0
FY 2010 Request	---	5,000.0
FY 2011-2014	---	18,000.0 [2]
Total	Various	$164,200.7

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Equipment Procurement	---	$1,750.0
2. Final incremental funding for on-going RVR installation projects and initial incremental funding for nine new projects	---	2,170.0
3. Logistics/Engineering Support	---	1,080.0
Total	Various	$5,000.0

[1] Includes $685,500 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. The FY 2001 appropriation has been adjusted to reflect the rescission amount pursuant to P.L. 106-554. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.
[2] Future requirements will be based on activity levels and local situations that are validated on a year-to-year basis.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2D05	Approach Lighting System Improvement Program (ALSIP)	$8,700,000	Various	N-04

FAA Strategic Goals: Increased Safety -– To achieve the lowest possible accident rate and constantly improve safety. Objective 1 - Reduce commercial air carrier fatalities.

Description of Problem: Many of the older approach lighting systems in the National Airspace System (NAS) have rigid approach lighting structures. Aircraft that accidentally strike these structures during departure or landing can incur substantial damage. The National Transportation Safety Board (NTSB) recommended replacing the rigid approach lighting structures with low-impact resistant structures that collapse or break apart upon impact.

Description of Solution: This program procures and installs frangible approach lighting equipment, including the High Intensity Approach Lighting System with Sequenced Flashing Lights (ALSF-2) and Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR). ALSF-2's are installed at runways requiring Category II/III precision approaches. MALSRs are installed at runways requiring Category I precision approaches. The entire ALSF-2 and MALSR systems are replaced when non-frangible structures are replaced.

In FY 2008, $15,000,000 was appropriated for engineering and technical services/support; funding for on-going ALSF-2 and MALSR replacement projects; procurement of ancillary components; and funding for Alaska-based projects. An additional amount of $4,312,000 was appropriated for distribution as follows:

Project	Amount
Airfields in Alaska	$2,499,000
Gulfport-Biloxi runway and centerline lighting	$490,000
Rutland State Airport MALSR	$1,323,000

In FY 2009, $13,614,000 was appropriated for replacement of the Seattle-Tacoma International Airport runway 16C ALSF-2; final incremental funding for ALSF-2 and MALSR replacement projects; procurement of ancillary equipments; and engineering and technical services/support.

Also in FY 2009, $806,000 was appropriated under the American Recovery and Reinvestment Act (ARRA) to modify an existing contract to perform the construction and installation activities associated with the replacement of the MALSR on runway 09R at Ohio State University Airport, Columbus, OH.

For FY 2010, $8,700,000 is requested to continued replacement of the Seattle-Tacoma International Airport runway 16C ALSF-2; initial funding for three MALSR replacement projects; procurement of 20 MALSR systems and ancillary equipment; and engineering and technical services/support.

Benefits: This program reduces fatality incidents and costs associated with aircraft accidents involving rigid approach lighting structures through the use of low-impact-resistant structures.

- Improved Safety: Safety benefits are estimated by comparing incidents and costs of life and equipment for collision accidents with rigid structures and non-rigid structures to estimate a differential cost per incident.

- Reduce Flight Disruption: Weather-caused flight disruptions – delays, diversions, over-flights, and cancellations – impose economic penalties on both aircraft operators and users. An operational MALSR or ALSF-2 allows an airport to remain open to traffic, when it would otherwise have closed, avoiding weather-caused flight disruptions. These benefits are calculated by estimating the number of flight disruptions avoided multiplied by the unit cost for a flight disruption. The unit cost for a flight disruption is based on assumed operating scenarios that describe the flow of events when a flight is disrupted.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$366,204.2 [1]
FY 2009 Appropriated	---	13,614.0
FY 2009 American Recovery and Reinvestment Act	---	806.0
FY 2010 Request	---	8,700.0
FY 2011-2014	---	16,000.0
Total	Various	$405,324.2

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. ALSF-2 Support Structure (Seattle-Tacoma – Runway End 16C)	---	$4,000.0
2. Final incremental funding for on-going replacement projects	---	2,450.0
3. Ancillary Equipment Procurement	---	350.0
4. Procure MALSR Systems	---	1,000.0
5. Logistics/Engineering Support	---	900.0
Total	Various	$8,700.0

[1] The FY 2001 appropriation has been adjusted to reflect the rescission amount pursuant to P.L. 106-554. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2D06	**Distance Measuring Equipment (DME)**	**$6,000,000**	**Various**	**N-09**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: Obsolete tube-type DME equipment collocated with the instrument landing systems (ILS) and terminal non-directional beacons is decreasing system efficiency. Replacement parts are largely unavailable. By providing the procurement and installation of upgraded, state-of-the-art DME systems, efficiency will improve by reducing the downtime required for the maintenance and repair of the antiquated DMEs.

Low-power distance measuring equipment (LPDME) is a critical part of the ILS during the aircraft's final approach to landing. LPDME replaces the Marker Beacons. An increase of the number of aircraft utilizing the equipment contributes to DME saturation and a shutdown of the systems. In addition, older equipment does not meet present availability and maintainability requirements. The FAA requires navigation systems of 99.95 percent availability or greater. Previous LPDME are unreliable, maintenance intensive and lack required Remote Maintenance Monitoring (RMM) capability. The capacity of older systems is less than 50 aircraft simultaneously and the mean time to repair can be greater than one hour.

Description of Solution: This program will replace older LPDME with new solid state LPDMEs. The LPDMEs will replace older marker beacons at existing ILS locations and be implemented at new ILS locations. The availability of the new LPDME is greater than 99.95 percent, mean time to repair is less than one-half hour, mean time between failures is 14,231 hours, and mean time between outages is 15,193 hours.

There are 451 identified Commercial Aviation Safety Team (CAST) requirements. However, FAA recommends implementation of only 177. This number would cover 80 percent of all operations. For safety reasons, the industry wants to discontinue step-down non-precision approach procedures whenever possible. The use of LPDMEs supports this operational goal for older, less-equipped aircraft, until these older aircrafts are outfitted with more advanced equipment

In FY 2008, $5,000,000 was appropriated to fund initial support for engineering and technical services as well as continue acquisition and implementation activities that would increase operational availability at existing and newly established runway ends.

In FY 2009, $6,000,000 was appropriated to fund engineering and technical services support; provide incremental implementation funding for on-going LPDME projects; and continue acquisition and implementation activities to increase operational availability at approximately 30 existing and newly established runway ends.

For FY 2010, $6,000,000 is requested to fund engineering and technical services support; provide incremental implementation funding for on-going LPDME projects; and continue acquisition and implementation activities to increase operational availability at approximately 25 existing and newly established runway ends.

Benefits: The LPDME program maps to the FAA goal of Reduced Congestion by increasing airport capacity to meet projected demand. The equipment can handle more than 100 aircraft simultaneously, thus increasing airport capacity by a factor of two. Cost savings can be expected at a location by discontinuing relevant step-down non-precision approach procedures.

Additional savings are will accrue when the marker beacons are replaced, through leasing the cost of the land, and discontinued maintenance of the older equipment. In addition, new equipment has the required RMM that can be maintained and certified remotely.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$26,015.8 [1]
FY 2009 Appropriated	---	6,000.0
FY 2010 Request	---	6,000.0
FY 2011-2014	---	16,000.0
Total	Various	$54,051.8

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Equipment Procurement and Installation	---	$4,400.0
2. Logistics/Engineering Support	---	1,600.0
Total	Various	$6,000.0

[1] The FY 2001 appropriation has been adjusted to reflect the rescission amount pursuant to P.L. 106-555. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2D07	Visual Navaids - Establish/Expand	$3,700,000	Various	N-04

FAA Strategic Goals: Increased Safety -– To achieve the lowest possible accident rate and constantly improve safety. Objective 1 - Reduce commercial air carrier fatalities.

Description of Problem: The Commercial Aviation Safety Team (CAST), a group including FAA, airline and airport personnel, has identified 781 runway ends that require implementation of a visual precision-like vertical approach capability. This capability will reduce the possibility of a controlled flight into terrain accident during approach and landing. The FAA has agreed to implement this capability at the 170 highest priority runways by installing Precision Approach Path Indicator (PAPI) systems.

Description of Solution: The FAA will procure and install PAPI systems to satisfy the CAST requirements. In addition, the older REIL systems are being replaced with new-generation REIL equipment that will eliminate the emerging life-cycle issues (i.e., Reliability, Availability, and Maintainability) associated with the older REIL systems currently in the NAS.

In FY 2008, $2,000,000 was appropriated for engineering and technical services/initial support; final incremental funding for ongoing PAPI projects; and initial funding for 12 new PAPI installation projects. An additional $1,500,000 was appropriated for evaluation/implementation of changes/modifications to operational PAPI systems.

In FY 2009, $1,700,000 was appropriated for engineering and technical services/initial support; final incremental funding for ongoing PAPI installation projects; and initial funding for six new PAPI installation projects.

For FY 2010, $3,200,000 is requested for engineering and technical services/initial support; nine PAPI systems; final incremental funding for ongoing PAPI installation projects; and initial funding for nine new PAPI installation projects. An additional $500,000 is requested for in-service engineering.

Benefits:

Improved Safety - Safety benefits stem from the reduction of accidents. Safety benefits are estimated by comparing incidents and costs of non-precision approach accidents with the same for precision-like approach accidents to estimate a differential cost per approach. Use of a precision-like landing capability of a PAPI will reduce accidents during landing. The REILs increase safety and capacity during landing by providing a pilot with the location of the approach end of the runway.

Reduced Controlled Flight Into Terrain - Controlled flights into terrain causes fatalities and imposes economic costs on aircraft operators. The visual precision-like vertical landing capability of the PAPI reduces the number of controlled flights into terrain.

In-service engineering allows for immediate response to emerging technology solutions. Funding is needed for ongoing engineering support of all prototyping efforts.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$195,718.4 [1]
FY 2009 Appropriated	---	1,700.0
FY 2010 Request	---	3,700.0
FY 2011-2014	---	11,600.0
Total	Various	$212,718.4

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Equipment Procurement (PAPI Systems)	---	$450.0
2. Final incremental funding for on-going installation projects and initial incremental funding for 9 new installation projects (PAPI)	---	2,250.0
3. Logistics/Engineering Support	---	1,000.0
Total	Various	$3,700.0

[1] The FY 2001 appropriation has been adjusted to reflect the rescission amount pursuant to P.L. 106-554. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2D08	**Instrument Flight Procedures Automation (IFPA)**	**$7,900,000**	**Various**	**A-14**

FAA Strategic Goals: Organizational Excellence -– Ensure the success of the FAA's mission through stronger leadership, a better trained and safer workforce, enhanced cost-control measures, and improved decision-making based on reliable data. Objective 3 - Improve financial management while delivering quality customer service.

Description of Problem: The legacy system, Instrument Approach Procedures Automation (IAPA) creates new Instrument Flight Procedures (IFP's) and sustains the 15,000+ existing IFP's. Developed in the early 1970's, the system is technically obsolete and increasingly unable to support the required safety and efficiency initiatives in the FAA Flight Plan. The legacy has no centralized database support and cannot be integrated into the FAA Enterprise Architecture.

The cost to maintain this system has escalated drastically. Specifically, the maintenance workload for existing IFP's has escalated at a rate of 45 percent each year since the mid-1990's. In addition, the demand for obstacle evaluation studies has doubled since the late 1990's to approximately 50,000 requests per year. These requests are expected to increase an additional 60 percent in the next ten years due to high definition television, cellular telephone industries, and wind turbines, etc. The majority of this workload is accomplished through manual processes with very limited automation support.

The increasing maintenance workload drastically diminishes the organization's ability to support the agency's initiatives such as: Required Navigation Performance (RNP), Area Navigation (RNAV), Wide Area Augmentation System (WAAS), Distance Measuring Equipment (DME), and Standard Terminal Automation Replacement System (STARS).

Description of Solution: This request will provide funding to replace the current IAPA system with next generation automated tools that generate products using fully integrated solutions for all aspects of visual and instrument flight procedures. In addition, this new system must be able to calculate, retain, and share the intricate business rules needed to design IFP's while automatically assessing impact of obstacles. The automated process must have the ability to evaluate new obstructions as well as perform necessary activities associated with changes in magnetic variation. Collaboration with the U.S. Air Force will save resources by developing a common tool that can still support unique agency requirements. The following projects are part of a tool suite called Instrument Flight Procedure Automation (IFPA):

- Instrument Procedures Development System (IPDS): IPDS provides a complete U.S. Terminal Procedures (TERPS) and International (ICAO) PANS-OPS criteria evaluation tool for the development or amendment of instrument flight procedures. IPDS will replace the legacy IAPA system and provide full coverage of new requirements, including international criteria.
- Obstacle Evaluation System (OE-IFR): OE-IFR will provide automation of existing or proposed obstacles' impact on IFP's, saving many staff hours expended in the current manual process. This module will be developed as a component of IPDS.
- Instrument Flight Procedures (IFP): IFP provides a repository for all IFP's and the ability to generate all 8260 series forms, as well as Aeronautical Radio Incorporated (ARINC) encoded IFP's for loading to aircraft flight management systems.
- Airports and Navigation Aids (AIRNAV): AIRNAV is a critical database and maintenance application for Airports, Runways, NavAids, and Obstacles used to support IFP development and maintenance.
- Automated Procedures Tracking System (APTS): APTS provides the ability to forecast and schedule IFP development, inspection and publication workloads.

In FY 2009, $10,900,000 was appropriated to continue development of the IPDS, OE, IFP, AIRNAV and APTS tools.

For FY 2010, $7,900,000 is requested for development of the IPDS, OE, IFP, AIRNAV and APTS tools. This request is in line with the program funding baseline approved by the JRC in September 2006.

The performance-based National Airspace System requires an investment in systems integration and the automation of aviation data for safety and reliability purposes, as well as an automated electronic means of information sharing. The FY 2010 request will provide funds to for the replacement of the current IAPA system with next generation automated tools that create products using fully integrated solutions for all aspects of visual and instrument flight procedures. This new system will be able to calculate, retain, and share the intricate business rules needed to design IFP's while automatically assessing the impact of obstacles. The automated process will have the ability to evaluate new obstructions as well as perform necessary activities associated with changes in magnetic variation. Collaboration with the U.S. Air Force (USAF) will save resources by developing a common tool that leverages USAF resources already expended on their Global Procedures Designer (GPD) tool.

Benefits: IFPA will support greater capacity by increasing the airport arrival capacity for eight major metropolitan areas, and at the OEP airports when visibility is restricted. The new IFPA suite will replace, modernize, and update IAPA systems in support of both visual and instrument flight procedure development such as approaches, standard terminal automation replacement system, airways, and departures. IFPA will greatly increase automated capabilities for all types of precision and non-precision flight procedures, including conventional and area navigation (RNAV) for en-route, feeders, arrivals and departures. In addition, the new program will build an integrated obstacle evaluation application, replacing a manual process. Existing systems cannot generate and integrate the necessary physical, temporal and spatial information needed to develop, inspect and publish flight procedures as well as evaluate the impact of obstacles. New technology is now available to meet these requirements.

While supporting FAA flight plan goals, continued support of IFPA will specifically provide the following overall benefits:

- Capability for ongoing maintenance of over 15,000 instrument flight procedures in use at over 4,000 paved airports, accommodating requirements for precision approaches and departures using Global Positioning System/area navigation, wide area augmentation system and local area augmentation system
- Efficient response to Air Traffic Obstacle Evaluation (OE) requests, addressing affects to instrument flight procedures, alleviating manual effort currently required for 50,000+ OE requests annually. In addition, application of TERPS rules as part of automated obstacle evaluation will be an important benefit.
- Replacement of IAPA's old 1970 obsolete computer hardware and software.
- Conversion of current IAPA software to OMB, DOT and FAA recommended architecture, providing opportunities for improved integration as well as a foundation for anticipated flight procedure demand well beyond FY 2009.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$62,992.6 [1]
FY 2009 Appropriated	---	10,900.0
FY 2010 Request	---	7,900.0
FY 2011-2014	---	6,500.0
Total	Various	$88,292.6

[1] Includes reduction pursuant to P.L. 108-199, January 23, 2004.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations	Estimated Cost ($000)
1. Instrument Procedures Development System (IPDS)	---	$5,000.0
3. Instrument Flight Procedures (IFP)	---	1,500.0
4. Airports and Navigational Aids (AIRNAV)	---	1,000.0
5. Automated Procedures Tracking System (APTS)	---	400.0
Total	Various	$7,900.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2D09	**Navigation and Landing Aids – Service Life Extension Program (SLEP)**	**$6,000,000**	**Various**	**N-04**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets project demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: On average, 60 percent of all visual and navigation aids in the NAS are greater than 23 years old and exceed their 20 years of Economic Service Life (ESL) by three or more years. Because many of these systems exceed their ESL, service disruptions are possible. Also, the existing medium intensity approach light system with runway alignment indicator lights (MALSR) and approach lighting system with sequence flasher 2 (ALSF-2) in-pavement steady burning approach lights are maintenance intensive. As a result, excessive runway down time exists that negatively impacts airport capacity.

There are approximately 800 MALSR systems in the NAS. The following provide a distribution of the MALSR systems in the NAS.

Manufacturer	Systems	Years in Service
GTE-Sylvania	30	34
SEPCO-Crouse Hines	42	33
Godfrey	127	33
Multi Electric	347	32
ADB-ALNACO	19	20
AVW Electronic (Remote Maintenance Monitoring Capability)	98	18
DME Corp. (RMM Capability)	137	10 or less

There are approximately 150 ALSF systems in the NAS. The following provides a distribution of the ALSF systems in the NAS.

Manufacturer	Systems	Years in Service
General Electric	3	47
Westinghouse	2	45
Hollingsworth	1	41
Heavy Duty	5	33
Godfrey	41	25
Airflow	46	20
New Bedford Panoramex	52	8 or less

Description of Solution: The older navigation aids are being replaced with new generation navigation aids that will eliminate the emerging life-cycle issues associated with the older navigation aids currently in the NAS. Additionally, the existing MALSR and ALSF-2 in-pavement steady burning approach lights will be replaced. Replacing aging, obsolete visual navigational aids and other ground-based navigation and landing aids maintains current en route, approach, and landing capabilities at various airports throughout the United States.

In FY 2008, $5,000,000 was appropriated to procure semi-flush fixtures and two ALSF-2 monitor that provide Remote Lamp Monitoring Systems, (RLMS); complete installations and engineering of 10 REIL, two MALSR, and four Remote Radio Control Systems; replace a MALSR tower and generator; undertake new technology initiatives, and provide engineering and technical services support.

In FY 2009, $1,000,000 was appropriated to install the Remote Lamp Monitoring System at two ALSF-2 OEP locations and install three REIL systems.

Also in FY 2009, $2,900,000 was appropriated under the American Recovery and Reinvestment Act (ARRA) to award one contract to procure and install 10 Replace Lamp Monitoring Systems (RLMS) at the following sites; Charlotte, NC; Tampa, FL; Dayton, OH; Forth Worth, TX; Detroit, MI; St. Louis, MO; Denver, CO; Portland, OR; Ontario, CA; and Oakland, CA.

For FY 2010, $6,000,000 is requested to procure semi-flush fixtures, continue new technology initiatives, complete installations and engineering of three MALSR, and one ALSF-2, extend the service life of seven ALSF-2 at OEP airports by replacing the constant current regulator and installing a monitor for Category II/III approaches, fund shortfalls in carryover projects; and provide engineering and technical services support.

Benefits: The replaced and upgraded equipment will help to reduce runway downtime and technician time associated with maintenance and repair of the visual and navigation aids. Additionally, the new in-pavement steady burning approach lights will require less maintenance, thus reducing runway downtime. These benefits will increase safety and airport capacity. The installation of RLMS' will reduce the need for technicians to physically monitor the ALSF-2's during adverse weather conditions.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$19,926.0 [1]
FY 2009 Appropriated	---	1,000.0
FY 2009 American Recovery and Reinvestment Act	---	2,900.0
FY 2010 Request	---	6,000.0
FY 2011-2014	---	23,000.0
Total	Various	$52,826.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Equipment Sustain/Replace/Install	Various	$6,000.0

[1] Includes reduction pursuant to P.L. 108-7, February 20, 2003.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2D10	**VASI – Replacement – Replace with Precision Approach Path Indicator**	**$4,000,000**	**Various**	**N-04**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 2 - Increase reliability and on-time performance of scheduled carriers.

Description of Problem: The Visual Approach Slope Indicator (VASI) system was initially deployed in the 1960's within the NAS and requires replacement with more modern systems. The VASI systems are no longer the visual slope indicator standard for the International Civil Aviation Organization (ICAO). The ICAO recommended that all airports serving international operations replace the VASI lights with Precision Approach Path Indicator (PAPI) lights to standardize on the visual vertical guidance information.

Description of Solution: Phase 1 of the replacement program procures and installs PAPI systems to replace the older VASI systems at International Runways. This first phase of the program addresses approximately 207 runways serving international operations. To date, FAA has completed 118 replacements with approximately 89 still remaining. Once the ICAO requirement is met, Phase 2 of the program will replace the remaining 850 VASI systems serving non-international operations.

In FY 2008, $3,000,000 was appropriated for engineering and technical services/support; final incremental funding for ongoing replacements of VASI with PAPI projects and initial funding for 15 new replacement projects.

In FY 2009, $4,000,000 was appropriated for engineering and technical services/support; procurement of 24 PAPI systems, final incremental funding for on-going VASI replace PAPI projects and initial funding for 15 new replacement projects.

For FY 2010, $4,000,000 is requested for engineering and technical services/support; procurement of 10 PAPI systems, final incremental funding for on-going VASI replace PAPI projects and initial funding for 11 new replacement projects.

Benefits: This program contributes to the FAA Strategic Goal of International Leadership. The PAPI system complies with the ICAO standard.

This replacement program:

- Fulfills the ICAO standard to install PAPI systems at all international runways.
- Responds to Airline Pilot's Association and General Aviation requests for PAPI's at validated approaches within federally controlled airspace.
- Reduces maintenance person-hours.
- Eliminates the currently supply support deficiencies related to lack of uniformity between various VASI configurations.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$51,370.0
FY 2009 Appropriated	---	4,000.0
FY 2010 Request	---	4,000.0
FY 2011-2014	---	24,000.0
Total	Various	$83,370.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. PAPI Equipment Procurement	---	$500.0
2. Final incremental funding for on-going replacement projects and initial incremental funding for 30 new replacement projects.	---	2,750.0
3. Logistics/Engineering Services Support	---	750.0
Total	Various	$4,000.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2D11	**Global Positioning System (GPS) Civil Requirements**	**$43,400,000**	**Various**	**N-12**

FAA Strategic Goal: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of the Problem: The National Space-based PNT policy (NSPD-39) requires civil agencies to fund new and unique civil GPS capabilities beyond the second and third civil signals already contained in the current GPS, specifically, the L1C signal and civil signal monitoring with DOT serving as the lead civil agency. FAA will include the funding to implement L1C and civil signal monitoring in its budget request for FY2009-2013 and serve as DOT's implementing agency for the civil funded capabilities. The global positioning system (GPS) is a satellite-based system that provides position, navigation, and timing (PNT) service to the U.S. government (USG) and the world with no direct user charges. GPS provides two PNT services; the precise positioning service (PPS), using the dual L1-C/A and L2 signals, and the Standard Positioning Service (SPS), using the single L1-C/A signal. Only the SPS is available for worldwide use by the civil community. Currently, GPS consists of second generation satellites (GPS-II) and the operational control segment (OCS). The GPS program is entering into a period of transition from GPS-II to the third generation (GPS-III) and the modernized operational control segment (OCX).

Description of Solution: Implementation of the L1C signal will consist of system design and development activities performed by the GPS-III and OCX prime contractors, managed by the USAF GPS Wing. In FY2010, the work required to implement L1C is expected to consist of system design and development activities and program management. The GPS Signal Monitoring system will consist of a worldwide network of 18-21 GPS monitor stations connected to two processing facilities. The monitor stations must be installed at worldwide geographically dispersed locations such that every GPS satellite can be continuously monitored from at least two monitor stations. The monitor stations will collect real-time measurements of the GPS signals (L1C, L1-C/A, L2C, and L5) and forward this information to the processing facilities where a suite of software algorithms will monitor the accuracy, integrity, continuity, and availability of performance to verify that modernized GPS is suitably safe for use.

For FY 2010, $43,400,000 is requested to accomplish the following activities:

- Program Management - $4,661,000 to prepare specifications, establish a development contract, and the resources necessary to monitor cost, schedule, and technical performance.
- Systems Engineering - $11,014,000 to develop the satellite architecture and system design for the L1C signal and new GPS monitor station receivers to collect the L1C, L1-C/A, L2C, and L5 measurements, establish new user avionics receiver standards, and algorithm description documents for the signal monitoring algorithms located at the processing facilities. This effort will also include site surveys, design of the terrestrial communications system, and implementation planning required prior to fielding of the ground infrastructure.
- Hardware and Software Development - $25,025,000 to design, procure, integrate, test, and factory acceptance of GPS monitor station and the processing facility equipment. The design and prototyping of the signal monitoring software algorithms will also be started.
- Test and Evaluation and Logistics Support - $2,700,000 is requested for test and evaluation planning, data collection to support prototyping, and logistics support planning for the GPS monitor station and processing facility equipment. Documentation will be developed to establish the operation standards and training needs for the GPS Signal Monitoring system.

Benefits: The Civil Unique GPS Capabilities (L1C and civil signal monitoring), in conjunction with GPS III/OCX modernization and new user receiver avionics, is expected, with other enhancements, to enable global aviation use of GPS for vertically guided approach operations, with minimum or possibly without augmentation, by 2028. This benefit is dependent on a DoD commitment to provide a minimum of 30 dual frequency (L1 and L5) GPS satellites with OCX that delivers 1-2 meter user range accuracy with high reliability.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$1,100.0
FY 2009 Appropriated	---	20,700.0
FY 2010 Request	---	43,400.0
FY 2011-2014	---	0.0
Total	---	$65,200.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Program Management	---	$4,661.0
2. System Engineering	---	11,014.0
3. Hardware/Software Development	---	25,025.0
4. Test and Evaluation/Data Collection and Documentation/Logistics Support	---	2,700.0
Total	---	$43,400.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2E01	**Fuel Storage Tank Replacement and Monitoring**	**$6,200,000**	**Various**	**F-13, M-39**

FAA Strategic Goals: Environmental Stewardship -– Reduce pollution and other adverse effects of transportation and transportation facilities. Objective 1 - Adopt transportation policies and promote technologies that reduce or eliminate environmental degradation.

Description of Problem: Fuel storage tanks (FST) support the critical operations of emergency power generators at FAA facilities across the NAS. A loss of integrity in the tank systems may result in critical facility outages during periods of emergency generator operations. A loss of integrity in the tank systems also poses a pollution threat to the surrounding built and natural environment.

FSTs have historically contained materials that could cause environmental harm or result in personal injury if released. In response to the risk of accidental release, the Federal government, the various State legislatures, local county and city jurisdictions have all passed laws specifying the minimum requirements for construction, installation, removal, and operations of fuel tank systems. Additional requirements affecting storage system operations have been established under the jurisdiction of state and local building codes, fire protection codes, airport authority requirements, and occupational safety and health acts. Failure to comply with all elements of the regulatory requirements exposes the FAA to risk of fines and other penalties including the right to use and refill the tank systems ("red tag" violations).

The FST systems installed prior to and including late-1980s have reached the end of their planned 20 year operations life cycle. The 3,005 NAS tank systems managed under the FST Program life cycle sustainment guidelines must be replaced or upgraded to assure continued integrity.

For example:

- Due to loss of fuel source, emergency power generators were inoperable and resulted in facility outages. Examples include: Cleveland ARTCC (36 minutes) and Sacramento ATCT (1 hour, 34 minutes) - Fuel system blockage; Nashville TDWR - Failed fuel supply line (17 hours, 3 min)
- Approximately 220 gallons of fuel released from the FST system at the Teterboro NJ ATCT engine generator as a result of component failure. Remediation efforts continue with remediation estimates exceeding $75,000.
- Approximately 275 gallons of fuel released from the FST system at the Juneau AK SSC facility heater tank as a result of impact by falling ice.
- Suffolk County NY environmental regulators issued Notices of Violation for failure to meet minimum construction and operations standards. The violations at two facilities on Islip NY MacArthur airport subject the FAA to potential fines in excess of $3,500. a day.
- Wisconsin Division of Environmental and Regulatory Services issued Administrative Orders requiring replacement of six tank systems not meeting minimum construction standards. Replacement costs exceeded $700,000. 220 FST systems currently operating beyond lifecycle replacement guidelines.

Description of Solution: The FAA will continue life cycle sustainment of the active FST inventory to support mission-critical activities and to assure compliance with regulatory requirements. The FST systems have varying life cycles depending on the specific hardware. FST integrity failures will be abated immediately to minimize adverse impact to personal and environmental safety, restore availability of the systems for National Airspace System (NAS) operations, and preclude regulatory fines.

Implementation of the ARTCC and Prime Power (PX) fuel storage system upgrades are major program initiatives. These critical facility fuel systems have been redesigned to provide enhanced technician control and increase operational readiness capacity. Components of the fuel storage system are being upgrade to comply with changing Environmental Protection Agency (EPA) storage tank regulations.

For FY 2010, $6,200,000 is requested to fund:

- Two ARTCC fuel storage system upgrades,
- One prime power (PX) fuel storage system upgrade,
- Emergency system repairs necessitated by unforeseen integrity losses,
- Modification efforts under environmental regulatory requirements, and
- Backlogged tank replacements

Benefits: The FST lifecycle sustainment programs maps to FAA goal of greater capacity by avoiding delays due to NAS equipment outages. Executing an FST life cycle sustainment program achieves the cost benefit of reducing the risk of leaking FST systems, minimizing adverse impacts to personal and environmental safety, restoring availability of the systems for NAS operations, and precluding regulatory fines of up to $32,500 per day.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$241,674.0 [1]
FY 2009 Appropriated	---	6,100.0
FY 2010 Request	---	6,200.0
FY 2011-2014	---	26,000.0
Total	Various	$279,974.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. ARTCC/Prime Power Initiative	3	$4,845.0
2. FST systems sustainment	Various	1,355.0
Total	3	$6,200.0

[1] Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2E02	**Unstaffed Infrastructure Sustainment**	**$18,200,000**	**Various**	**F-12, M-08**

FAA Strategic Goals: Greater Capacity - Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem:

UIS: The FAA owns thousands of buildings whose sole purpose is to house, support and protect the National Airspace System (NAS) Communications, Surveillance, and Navigation aids. These structures are failing. They suffer from leaking roofs, deteriorated foundations and walls, inadequate air conditioning systems and electrical systems, and severely eroded roads that hinder access by FAA technicians. A majority of these 23,000 structures were built during the 1940's and 1950's. There are currently over $185,300,000 in maintenance projects that have been deferred. This backlog will continue to grow and continue to threaten the FAA's ability to add capacity, unless funding for maintenance is increased.

Seismic: The FAA is required by Public Law (42 USC 7701), Executive Order (12699 and 12941) and DOT Policy (SS-98-01) to fund and execute a cost effective, long term earthquake risk mitigation program. The Seismic Safety Risk Mitigation program is the FAA's effort to comply with these mandates, protect the safety of FAA employees, protect the buildings and equipment in earthquake prone regions, control the cost of mitigation and reduce the cost of avoidable repairs following an earthquake. Significant and unacceptable life safety risks have been identified at over 50 FAA facilities. These risks place the safety of FAA employees and the flying public in jeopardy. The potential for injury, loss of life, loss of buildings and equipment, and loss of hundreds of millions of dollars in Trust Fund revenue from NAS disruptions are entirely avoidable.

Description of Solution: In FY 2009, $4,300,000 was appropriated under the American Recovery and Reinvestment Act (ARRA). This funding will support 128 projects to remove and replace HVAC systems at various airports. All activities are planned to be completed by September 2010.

For FY 2010, $17,000,000 is requested to make repairs to the facilities that have the greatest impact to the NAS, with an emphasis toward OEP airports. Modifications and refurbishments are required to extend the service life of these structures. These maintenance actions include replacing antiquated heating, ventilation and air conditioning (HVAC); replacing old electrical wiring; repairing damaged roofs, foundations and walls; doors and windows, refurbishment of steel towers, clearing of vegetation and grading of rutted access roads. Also, $1,200,000 is requested for in-service engineering.

Benefits: The Unstaffed Infrastructure Sustainment (UIS) Program will reduce the backlog of deferred maintenance by 10 percent. The majority of the unstaffed facilities provide surveillance, communications, weather, and air traffic assistance to remote areas in a very efficient and cost saving manner. While no labor costs are necessary to operate these facilities, the facilities require periodic upgrades. The program extends the service-life of the buildings and equipment, avoids system outages and provides cost savings for FAA, the airline industry and the public.

In-service engineering allows for immediate response to emerging technology solutions. Funding is requested for on-going engineering support of all prototyping efforts.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$279,885.3 [1]
FY 2009 Appropriated	---	15,300.0
FY 2009 American Recovery and Reinvestment Act	---	4,300.0
FY 2010 Request	---	18,200.0
FY 2011-2014	---	63,500.0
Total	Various	$381,185.3

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Structural improvements	---	$17,000.0
2. In Service Engineering	---	1,200.0
Total	Various	$18,200.0

[1] Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2E03	**Aircraft Related Equipment Program**	**$10,000,000**	**Various**	**M-12**

FAA Strategic Goals: Increased Safety -– To achieve the lowest possible accident rate and constantly improve safety. Objective 1 - Reduce commercial air carrier fatalities

Description of Problem: The Flight Inspection (FI) aircraft fleet must be continually updated to meet the requirements of the NAS and help the NAS evolve to a performance-based system. Currently, 68 percent of the flight inspection fleet is limited in its support capabilities. The aircraft avionics and flight inspection mission systems require regular updating to meet Next Generation requirements. A performance based NAS allows civil aircraft to navigate airspace more safely and with greater flexibility than the current ground based system. Performance based initiatives will be achieved through implementation of Required Navigation Performance (RNP) area navigation, in addition to local area augmentation system (LAAS) and wide area augmentation system (WAAS). To meet these safety and greater capacity objectives, the FI aircraft fleet must be updated to continue to certify an expanding number of RNAV RNP, RNP, LAAS, and WAAS approaches at the lowest possible cost. The Flight Inspection aircraft fleet is composed of 31 specially equipped aircraft.

1. Aircraft Related Equipment Program - ($9,000,000):

Description of Solution: This program will provide service life extension projects and technical equipment upgrades and/or replacement to existing aircraft and mission equipment to meet performance requirements and ensure NAS safety by extending the expected life-cycle of 20 years to more than 30 years.

For FY 2010, $9,000,000 is requested to continue on-going initiatives from prior years and to implement new starts for the critical safety and capacity initiatives of the FAA Flight Plan:

- Next Generation Automated Flight Inspection System (NAFIS): NAFIS is a system that provides Flight Inspection (FI) capabilities in areas inaccessible by current FI aircraft. Technology upgrades are required to meet FI system modernization and increase independent truth system accuracy requirements to support the Future Air Navigation System (FANS) activity of the International Civil Aviation Organization (ICAO) and the Agency's Free Flight 2000 Program. The Automated Flight Inspection System (AFIS) is continually refreshed to comply with evolving NAS and the new space based Air Traffic System mission performance technology. Continued development of a NAFIS will employ an independent truth system and avionics suite to certify specialized instrument approaches and enable Standard Instrument Approach Procedures to locations that have been unable to have instrument approach capabilities. NAFIS uses advances in technology to reduce system weight resulting in increased aircraft range and fuel savings and will be adaptable to future FI aircraft.
- BE-300 Navigational Flight Management System (FMS) and Avionics Systems; Service Life Extension Program (SLEP): This will replace the current navigational system, interior and avionics suite in the BE-300 model FI aircraft with new spaced based Air Traffic System capable flight management system. This upgrade will also assist in weight reduction resulting in increased endurance and fuel savings, thereby, providing lower RNAV/RNP and WAAS unit costs.
- Challenger 601 Navigational FMS and Avionics Systems; SLEP: Replace current navigational system, interior and avionics suite. The existing Challenger 601 aircraft avionics are 16 years old.

Benefits: The improvements provided by this program will help the agency achieve FAA Flight Plan safety and increased capacity objectives.

- NAFIS Transition from AFIS: This will increase the safety composite index by providing a means to ensure the integrity of existing, new, and improved navigational aids introduced into the NAS. The FAA will keep pace with the increase in NAS facilities and will control costs while supporting FAA Flight Plan by providing the flying public greater safety and quality of service, and ensuring a safe air traffic system. NAFIS will verify infrastructure integrity and accuracy required in the evolving NAS. This project also is a replacement for a system that can not be sustained with current equipment. The hardware is out of date and is not supportable.

- BE-300 Navigational Flight Management System (FMS) and Avionics Systems; Service Life Extension Program (SLEP): The FMS will replace two older existing systems and provide reduced weight and power usage and increase limited cockpit space. Standardizing the FI fleet will enable the agency to achieve FAA Flight Plan goals of safety and system efficiency by improving the FI capabilities for the new space based Air Traffic System and support Operational Evolution Plan (OEP) initiatives to expand system capacity (RNP, WAAS, LAAS, FI capability).
- Challenger 601 Upgrade/SLEP: This will replace two older less capable systems. It will standardize the FI fleet and enable the agency to achieve FAA Flight Plan goals of safety and system efficiency by improving the FI capabilities for the new space based Air Traffic System and support Operational Evolution Plan (OEP) initiatives to expand system capacity (RNP, WAAS, LAAS, FI capability).

2. Aircraft Related Equipment Program - Boeing Simulator Replacement - ($1,000,000):

Description of Solution: For FY 2010 $1,000,000 is requested to continue technical refresh of the simulator, including LCD visual interaction, and provide technical refresh for the B737-800 NG, Level D, advanced flight simulator installed in the Flight Standards Flight Operations Simulator Laboratory (FOSL). This simulator is used to perform R&D operational evaluations of new aviation technologies and collect associated data prior to in-flight testing by FAA aircraft and NAS implementation.

To meet future NextGen requirements, a technical refresh of the B737 simulator will be required. The systems requiring technical refresh:

- Aircraft displays
- Electronic Flight Bag (EFB)
- Automatic Dependent Surveillance-Broadcast (ADS-B)
- Enhanced Vision System/Synthetic Vision System (EVS/SVS)
- Update the Host Computer system
- Auto-Pilot System

Benefits: The B737-800 Level D advanced flight simulator is currently being used in the Flight Operations Simulation Laboratory (FOSL) in Oklahoma City, OK.

All new aviation technology and in-flight operational procedures proposed for integration within the NAS requires research, development, evaluation and certification before implementation. This highly instrumented test platform simulator replicates a realistic in-flight environment and provides the capability for real-time "human-in-the-loop" testing. In addition, safety initiatives identified by the FAA, JPDO, NexGen, OEP and the National Transportation Safety Board (NTSB) are incorporated in the utilization of the simulator. A technical refresh will be required for the B737-800 advanced flight simulator to ensure that the high fidelity capabilities are maintained, validating human, aircraft and aeronautical data collection.

Such evaluations are necessary to support critical flight safety and NAS modernization issues such as RNP, RNAV, EFB, EFVS, WAAS, OEP, ADS-B, Wake Vortex, Aeromedical studies, Airport Safety Technology, Surface Technology and Visual Guidance, Pilot/Controller Human Factors Studies, etc.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$104,984.0 [1]
FY 2009 Appropriated	---	7,800.0
FY 2010 Request	---	10,000.0
FY 2011-2014	---	40,000.0
Total	Various	$162,784.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Automated Flight Inspection System (AFIS)/ Next Generation Flight Inspection System (NAFIS)	---	$6,600.0
2. BE-300 Navigation, Flight Management and Avionics	---	2,000.0
3. Challenger 601 Upgrade/SLEP	---	400.0
4. Technology Refresh	---	1,000.0
Total	Various	$10,000.0

[1] Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2E04	**Airport Cable Loop Systems – Sustained Support**	**$6,000,000**	**Various**	**F-10**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: On-airport FAA maintained telecommunications systems use direct burial copper cable to transport FAA information from airport traffic control towers (ATCT) to other FAA facilities. The majority of the cable installed at airports has exceeded its life expectancy, resulting in an increase in emergency repairs that reduce the safe and efficient flow of aircraft. The overall age of existing cable systems, along with a need for the system to provide increased capacity and availability, led to the development of the Airport Cable Loop Systems Sustain Support program.

All towers and on-airport surveillance, navigation, landing, and communication nodes send and receive information via this communications infrastructure, the communications backbone of the airport. Most of the communications within the NAS is comprised of aged copper cable (some are beyond their respective service life), first installed when the facilities were commissioned. The majority of the cable has been spliced numerous times, which has further reduced the cables service life and capacity, as well as increased the maintainability requirements to keep the services that are running over the cable operationally available for ATC.

Surveillance, landing, and air communications systems at many large airports are endangered because of the condition of the underground cables supporting these systems. Much of the control and signal cables serving critical airport facilities are 25 to 40 years old and badly deteriorated. This makes the NAS vulnerable to catastrophic failure. Existing airport control cable configurations do not allow for redundant communication paths between these systems and towers. Most of the NAS control and signal cable infrastructure is copper and is highly susceptible to damage from lightning strikes, electromagnetic pulses, electromagnetic interference, corrosion, and rodents. The cable infrastructure supporting the new NAS systems being brought on line must be upgraded.

Description of Solution: The Airport Cable Loop Program replaces deteriorating or antiquated cable systems at major airports with redundant/diverse fiber optic communication loops. On-going projects include fiber optic loops at Chicago O'Hare, Atlanta, LaGuardia, Chicago Midway, Portland, Las Vegas and Memphis.

In FY 2009, $7,000,000 was appropriated to fund the following locations; Portland, LaGuardia, Denver, Newark, Charlotte Douglas, Washington Ronald Reagan National, Cincinnati Northern Kentucky, Boston-Logan Phase 2, Houston and Austin. The funding will also provide for upgrade and retrofit support, program support, engineering, training, logistics support, testing, and configuration management.

For FY 2010, $6,000,000 is requested to begin projects for John F Kennedy, Baltimore, Cleveland, Ft. Lauderdale, Philadelphia, Oakland, Ontario, Los Angeles, and Van Nuys airports. In addition, this funding will cover continuing work at Newark, Cincinnati Northern Kentucky, Boston-Logan Phase 2, Charlotte Douglas, and Covington. The funding will also provide for upgrade and retrofit support, program support, engineering, training, logistics support, testing, and configuration management.

Benefits: The cable loop program maps to FAA goal of increased capacity by reducing or eliminating communications cable related outages. The program also supports the goal of increased on-airport safety by reducing or eliminating A and B runway incursions. System reliability and safety are enhanced due to increased system performance from multiple pathways provided by the cable loop system. Standardizing requirements will simplify logistics, configuration management, training, procurement, and depot support. There will now be a standard building block approach for installation and service. The FAA will realize savings in costs, resources, and time. Using fiber optic cable instead of copper will reduce the possibilities of interference and impedance faced by copper wire currently in use. Fiber optic cable is impervious to extremes in weather, lightning strikes, electromagnetic pulses, and electromagnetic interference. By using fiber optics, the agency will be assured of bandwidth and capacity to serve future systems.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	32	$52,815.1 [1]
FY 2009 Appropriated	8	7,000.0
FY 2010 Request	---	6,000.0
FY 2011-2014	---	20,000.0
Total	40	$85,815.1

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Site Engineering and Fiber Optic Installation	---	$5,245.0
2. Program Management Support	---	565.0
3. Engineering Support/Design/Documentation	---	190.0
Total	Various	$6,000.0

[1] Includes $1,300,000 reduction of the FY 2002 funds pursuant to supplemental P.L.107-206, January 23,2002. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2E05	**Alaskan NAS Interfacility Communications System (ANICS)**	**$9,000,000**	**Various**	**C-17**

FAA Strategic Goals: Increased Safety -– To achieve the lowest possible accident rate and constantly improve safety. Objective 2 - Reduce the number of fatal accidents in general aviation

Description of Problem: The Federal Aviation Administration's (FAA) Alaskan Satellite Telecommunications Infrastructure (ASTI) is based on technology platforms that are obsolete. In many cases, system components are no longer available for needed replacement and repairs. Since ASTI provides Alaska with 90 percent of the inter-facility communications for critical, essential, and routine air traffic control services, a technical refresh is needed to ensure future system availability to meet critical air traffic requirements. Currently, the required availability of 0.9999 is not being met. Availability is below 0.999 and declining. In addition, ASTI lacks a systematic funding process that addresses equipment aging and climatic impacts.

As a result of system aging, equipment obsolescence, and extreme Alaskan weather, trend data indicates increased system degradation of sites installed in the mid-1990's. Equipment that is impacted includes cabling, antenna feed assemblies, power boxes, deicers, controllers, cards, radomes, and ancillaries. Some parts and software are no longer supported by the manufacturer and need to be replaced.

Description of Solution: The FAA has established a six-year schedule (FY 2007 – FY 2012) for the technical refresh of the ASTI system estimated to cost $40,800,000.

For FY 2010, $9,000,000 is requested to install satellite modems, modem switches, multiplexers, antenna and radome replacements, and network monitoring and control system. FY 2010 activities also include efforts to establish training and logistics support.

Benefits: The ASTI technical refresh will improve and sustain the availability of the infrastructure and reduce future operations and maintenance costs by $78.6 million from FY 2009 - FY 2030. In FY 2007, ASTI facility availability was 99.8 percent. The technical refresh of aging facilities in Alaska will improve facility availability and enable efficient use of FAA assets.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	87	$128,806.9 [1]
FY 2009 Appropriated	---	5,000.0
FY 2010 Request	27	9,000.0
FY 2011-2014	---	22,800.0 [2]
Total	114	$165,606.9

[1] Includes $2,000,000 reduction for the FY 1999 Essential Air Services reprogramming. Also includes $786,900 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999.
[2] Future requirements are currently under review.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Replace Satellite Modems	---	$3,300.0
2. Marine Site Radomes	---	1,250.0
3. Sparrevohn Clean-up/Replace	---	1,000.0
4. L – Band Changeover	---	700.0
5. Program Management	---	2,200.0
6. Complete Modem Switch Upgrade	27	550.0
Total	27	$9,000.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2E06	**Facilities Decommissioning**	**$5,000,000**	**Various**	**F-26**

FAA Strategic Goals: Organizational Excellence -– Ensure the success of the FAA's mission through stronger leadership, a better trained and safer workforce, enhanced cost-control measures, and improved decision-making based on reliable data. Objective 3 - Improve financial management while delivering quality customer service.

Description of Problem: The June 2005 GAO report "Air Traffic Operations, the Federal Aviation Administration Needs to Address Major Air Traffic Operating Cost Control Challenges" states that FAA needs to expand its efforts to cut operational costs to address an expected gap between budget forecasts and expenses. The report recommends accelerating ground-based navigational aids decommissioning.

In recent years FAA has decommissioned many redundant or underused facilities. Funding was identified in FY 2007 to begin the divestiture (including environmental testing, property restoration, and equipment disposal) of those facilities. In addition, FAA has plans to decommission entire classes of facilities such as Non-Directional Beacons and Remote Communications facilities.

This program funds disposal activities including:

- terminate environmental due diligence audits (EDDAs),
- testing for environmental clean-up and hazmat abatement and disposal,
- non-hazmat real property site restoration, demolition, and disposal,
- lease termination liabilities,
- equipment (personal property) removal, reuse, and disposal,
- removing telecommunications systems, services, and circuits,
- frequency spectrum reallocation,
- modification of the National Airspace System Resources (NASR) database, aeronautical charts, and terminal procedures publications, and
- address cultural and historic preservation and natural resource protection issues.

Description of Solution: This program will result in the final disposition of existing buildings, structures, or real and personal property.

For FY 2010, $5,000,000 is requested to fund costs associated with the decommissioning of facilities. The FAA projects over 1,000 facilities will need to be evaluated. The funding request will include the following:

- Payment for environmental testing (but not remediation, which is funded elsewhere in this budget);
- Costs associated with the restoration of the land including demolition and final disposition of excess structures;
- Payments to property owners in lieu of restoration;
- Funds for screening, transporting, and final disposition of associated personal property;
- Costs for disposition of telecommunications and other utility systems, services, and circuits;
- Costs to assure that relocated frequencies do not interfere with other equipment;
- Incremental costs associated with changes to publications and databases;
- Costs associated with addressing cultural, historic, and natural resource preservation;
- Funds for developing business tools to enhance decommissioning activities; and
- Funds for studies and implementing resulting procedures and practices to enhance program effectiveness and efficiencies.

Benefits: Providing funds for the final disposal of structures, equipment, and real estate that is no longer required by FAA supports the infrastructure investments to maintain existing capacity in a cost effective manner.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	5,900.0
FY 2009 Appropriated	---	5,000.0
FY 2010 Request	---	5,000.0
FY 2010-2014	---	15,000.0 [1]
Total	Various	$30,900.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Facility Disposition	Various	$5,000.0

[1] Future requirements will be based on activity levels and local situations that are validated on a year-to-year basis.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2E07	**Electrical Power Systems - Sustain/Support**	**$101,000,000**	**Various**	**F-11, M-39**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The National Airspace System (NAS) power system infrastructure is critical to both maintaining existing capacity and increasing the capacity of the NAS in the future. Analysis of NAS outage data shows a significant link between delays and the reduced reliability and aging of the NAS power system infrastructure. Failure of the aging power infrastructure has led to significant delays and resulted in investigations by the National Transportation Safety Board and the Department of Transportation Inspector General. The Power Systems Group is proactively addressing this situation to mitigate future risk from NAS power outages.

Of the $4.6 billion NAS power system infrastructure, $2.2 billion represents the power cable at airports essential to the operation of all air traffic. Seventy-five percent of this cable is well beyond the condition and age that commercial power companies would continue to operate. This has led to major airport disruptions. A proactive program is planned to tackle this significant risk. The current infrastructure is failing to deliver the power reliably, resulting in outages and delays. The FAA must maintain the current Air Traffic Control (ATC) system capacity by replacing unreliable power system equipment to avoid increasing power outages and service interruptions in the future. The following components of the ATC power system require immediate attention:

- Power Cable: The top 300 airports require 18 million feet of power cable to sustain operations. Seventy percent of these power cables are at a high risk of failure, which could lead to extended delays and outages. Replacement of this cable costs $120 per foot and would normally be expected to last 30 years. The FAA aims to extend the life of this cable to 60 years with precise identification of candidate cables for replacement. Even with a 60 year life the annual cost of the cable replacement is estimated to be $35 million. Several Operational Evolution Plan airports are operating with cable between 50 and 60 years old and are experiencing significant failures and delays. Replacing unreliable terminal power cables will be given the highest priority in this request.
- Uninterruptible Power Supply (UPS): An uninterrupted power supply is a device that prevents power disruptions and surges from adversely affecting electronic system performance. A UPS is necessary within an Airport Traffic Control Tower to ensure the continued performance of the facility and eliminate power disruptions to critical infrastructure. The FAA currently maintains 1,783 UPS with an expected service lifetime of 20 years. A significant portion of the UPS inventory requires replacement due to reliability and supportability issues attributable to age. UPS batteries require refurbishment on a four year cycle.
- En Route Power Systems: The FAA maintains 23 En Route Center power systems. Because of the critical role of the En Route Centers in the NAS, 100 percent of the power systems require sustained funding to maintain service life. The Los Angeles Air Route Traffic Control Center outage highlighted a system flaw or single point of failure that can lead to the loss of all critical and essential power and significant delays to air traffic. Each ARTCC requires $5,000,000 to correct this situation. The delivery of this correction will take several years to complete due to funding and disruption constraints.
- Radar Lightning Protection: ATCT radars face threats to operability from both man-made sources and lightning. Lightning Protection systems are incorporated to ensure ATCT radars do not sustain damage from lightning. Lightning protection and grounding is applicable to over 16,000 FAA facilities. Lightning protection and grounding systems require systematic refurbishment after a service life of 25 years.
- Direct Current (DC) Power Systems: DC power systems are used to provide a low cost, shorter term alternative to an engine generator. Critical safety electronic system availability is increased and commercial power disturbances of up to several hours no longer disrupt air traffic operations. The FAA maintains 541 DC Power systems with a service life of up to 15 years.

- Engine Generators: Engine generators serve as a backup power source for essential NAS electronic systems when commercial power becomes unreliable due to a weather system, natural disaster or other electrical outage beyond FAA control. Without an engine generator, a FAA site may expect 10 or more hours per year of commercial power failure and hence significant NAS disruption. The FAA maintains 3,565 NAS engine generators with a useful service life of 24 years. Maintenance of the aged inventory has increased five fold in six years with a significant reduction in reliability and availability.
- NAS Batteries: Batteries serve as a backup power source for key NAS facilities including navigation aids and communications. These batteries provide limited power during major power system disruptions and maintain the function of key systems while the NAS transitions to a safe level of reduced operation. The FAA maintains in excess of 4,000 battery installations with periodic replacement.

Prioritization: Projects will be prioritized to provide the maximum reduction of risk of loss of NAS service. This will utilize the magnetized impact priority model developed by the Air Traffic Organization (ATO) for the Power Services Group. This model prioritizes sustainment projects to the locations in the NAS that would result in the most disruption.

Description of Solution: Reliable distribution, conditioning and standby power systems must be in place to operate the NAS as well as to maintain the capacity of the NAS during commercial power outages.

For FY 2010, $101,000,000 is requested to accomplish the following:

- $7,500,000 to replace batteries.
- $4,500,000 to replace PCS.
- $6,500,000 to replace DC systems.
- $28,000,000 to sustain the En Route Centers' critical power distribution systems.
- $4,500,000 to correct grounding and lightning protection systems.
- $15,000,000 to proactively replace airport power cables.
- $3,000,000 to establish/commission PSOSC (Power Services Operational Support Center)
- $18,000,000 to replace aging engine generators.
- $2,000,000 to sustain critical power distribution systems.
- $9,000,000 to provide Power System Sustain Support (PS3) and project support system engineering.
- $3,000,000 to sustain prime power (PX) sources (no electrical utility).

In FY 2009, $50,000,000 was appropriated under the American Recovery and Reinvestment Act (ARRA) to award several contracts for implementation of power services needs similar to those identified above.

Benefits: The Electrical Power Systems Sustain Program maps to FAA goal of greater capacity by avoiding delays due to NAS equipment outages. Backup power systems provide an average of 40 hours of operation for each FAA facility per year during commercial power disruption. This operation would not be possible with commercial power alone and significant NAS disruption would result.

For an ARTCC one hour of disruption is very conservatively estimated to be worth $1.5 million. Therefore, backup power provides a benefit of $60 million per year per ARTCC or a total of $1.26B per year for ARTCC alone.

All backup power systems return their cost within six months of initial installation and exceed OMB expectations for lifetime. ARTCC ACEPS backup power systems are delivered at one third of the cost of commercial equivalents.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$426,615.0 [1]
FY 2009 Appropriated	---	50,000.0
FY 2009 American Recovery and Reinvestment Act	---	50,000.0
FY 2010 Request	---	101,000.0
FY 2011-2014	---	642,500.0
Total	Various	$1,270,115.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Regional Site Work	Various	$93,000.0
2. Washington Headquarters Procured Equipment and Services	---	8,000.0
Total	Various	$101,000.0

[1] Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
2E08	Aircraft Fleet Modernization	$5,969,000	Various	M-11

FAA Strategic Goal: Increased Safety – Reduce the commercial airline fatal accident rate

Description of Problem: FAA is unable to perform critical in-flight jet transport test functions required to serve the U.S. air carrier industry in validating proposed new communications, navigation, surveillance, and landing systems. The Agency also is unable to analyze/measure human factors impacts on jet transport pilots and crews induced by new aviation concepts and technologies, systems integration, equipment and procedures needed for transition to the "new NAS." The Agency's 32-year-old Boeing Model B-727 jet transport aircraft -- historically used for these functions – has become technologically incapable of performing meaningful and relevant testing demanded by the U.S. airlines to expand NAS capacity through "Free Flight" and "Safer Skies" initiatives.

Description of Solution: For FY 2010, $5,969,000 is requested to purchase two aircraft for the flight inspection mission. The FAA must acquire modern jet transport aircraft equipped with a suite of digital cockpit avionics representative of the current and future U.S. airline jet aircraft population. This solution evolved from an exhaustive investment analysis (IA) conducted by an objective, highly-respected aviation-consulting company, Conklin, deDecker and Associates, Inc. The invest analysis considered all practical alternatives to overcome the current shortfalls, and thoroughly assessed economic, technological and airworthiness issues relative to establishing and sustaining the capabilities for performing required tests most effectively at the lowest possible 20-year-life cycle cost. The existing B-727 aircraft has served well for 25 years in an analog technology aviation environment, but no longer is representative of the air carrier aircraft population.

Description of Benefits: New aircraft will re-establish the Agency's lagging credibility with the airlines by performing timely, aggressive and effective in-flight testing with the confidence and integrity of an aircraft representative of the current and future air carrier fleet. Critical tests will be performed as required in the transition from the controller-based air traffic control (ATC) environment to the air traffic management (ATM) environment of pilot/controller shared responsibility. ATM requires the transmission of ATC and weather data to a digital cockpit for the pilot's use. A digital cockpit will process and display data received from the ground and from satellite transmissions. As a critical part of the transition from ATC to ATM, FAA will be capable of analyzing impacts of introducing advanced digital technologies to the cockpit, and the additional information processing/decision-making required of the flight crew. Analyses also will consider the coordination of decision-making and procedures in the cockpit and on the ground, and the human factors/safety implications. Other benefits will be less-frequent scheduled and unscheduled maintenance, improved COTS parts availability and warranties, and lower operating costs made possible by more fuel-efficient engines that also provide increased range. The increased range will allow real time on-site work to be accomplished in the oceanic environment where future communications, navigation and surveillance (CNS) procedures will be used.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$284,843.0
FY 2009 Appropriated	---	27,900.0
FY-2010 Request	---	5,969.0
FY 2011-2014	---	9,000.0
Total	Various	$327,712.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Aircraft Purchase	Various	$5,969.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
3A01	Hazardous Materials Management	$20,000,000	Various	F-13

FAA Strategic Goals: Environmental Stewardship -– Reduce pollution and other adverse effects of transportation facilities. Objective 1 - Adopt transportation policies and promote technologies that reduce or eliminate environmental degradation.

Description of Problem: The FAA has identified over 700 contaminated sites at 200 locations nationwide that require investigation, remediation, and closure.

The United States Environmental Protection Agency (EPA) lists federal facilities that require remediation actions on the Federal Hazardous Waste Compliance Docket (FHWCD). Currently, there are 73 DOT facilities listed on the Docket, of which 70 are FAA facilities, the most of any DOT organization. Of the 70 sites FAA is responsible for, 65 have achieved No Further Remedial Action Planned (NFRAP) closure documentation from EPA. The FAA is currently conducting investigation, remediation, and closure activities at the five FHWCD sites that have not achieved NFRAP. Those sites are:

- Kirksville ARSR, AFS P-64,
- Mike Monroney Aeronautical Center,
- Omaha EX Air Force Station Z-7,
- Ronald Reagan National Airport, and
- William J. Hughes Technical Center.

Site investigations at the identified sites have revealed that toxic contamination resulted from a variety of hazardous substances, including cleaning solvents, degreasing agents, pesticides, asbestos, polychlorinated biphenyls (PCBs), and heavy metals. The FAA has mandatory cleanup schedules in place as part of enforcement agreements with regulatory agencies. These agreements require the FAA to remediate contaminated soil and groundwater. Extensive contamination at the William J. Hughes Technical Center prompted EPA to place the site on the EPA National Priorities List (NPL or Superfund) as one of the Nation's most environmentally dangerous sites. Other contaminated sites (many of which are located in Alaska) and the requirements of the Hazardous Materials Management program account for a large portion of unfunded liabilities documented in FAA's financial statement.

Description of Solution: To manage and remediate these contaminated sites, FAA developed the Hazardous Materials Management program. To achieve compliance with all federal, state, and local environmental cleanup statutes, including the Resource Conservation and Recovery Act of 1976, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and the Superfund Amendments and Reauthorization Act of 1986, FAA must continue mandated program activities. The FAA's program activities include investigating sites; managing hazardous materials and hazardous waste accumulation, handling, and disposal; installing groundwater monitoring wells; remediating site contamination; and controlling air pollution.

For FY 2010, $20,000,000 is requested as follows:

- Continue to attain 93 percent "No Further Remedial Action Planned" closure documentation for FAA listed on EPA's Federal Hazardous Waste Compliance Docket by conducting contaminant investigations, implementing site remedial projects, and completing regulatory closures at the five remaining Docket sites: William J. Hughes Technical Center; Ronald Reagan Washington National Airport; Mike Monroney Aeronautical Center; Omaha EX Air Force Station ; and Kirksville ARSR Air Force Station; and
- Continue to perform investigations and remediation projects at all other identified contaminated sites in accordance with state mandates and enforcement agreements to limit future liability to the Agency and foster environmental stewardship.

Benefits: The Hazardous Materials Management program maps to FAA goal of Environmental Stewardship by reducing pollution and other adverse effects of transportation and transportation facilities. The program significantly decreases financial and operational risks to FAA through assessing and remediating contaminated sites. The Hazardous Materials Management program also ensures that FAA complies with the Department of Transportation's performance goal of placing 93 percent of all sites listed on the EPA Federal Hazardous Waste Compliance Docket into the status of "No Further Remedial Actions Planned."

A 2002 cost benefit analysis performed by Booz Allen Hamilton determined a benefit ratio of 3.7 and an internal rate of return of 12.6 percent.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$332,419.7 [1]
FY 2009 Appropriated	---	18,000.0
FY 2010 Request	---	20,000.0
FY 2011-2014	---	80,000.0
Total	Various	$450,419.7

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Superfund Sites Remediation	Tech. Center, Atlantic City, NJ	$9,000.0
2. Investigation and Remediation	Alaskan Region	5,800.0
3. Investigation and Remediation of Other Sites in FAA Regions; and Program Management	---	5,200.0
Total	Various	$20,000.0

[1] Includes $3,400 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
3A02	**Aviation Safety Analysis System (ASAS)**	**$10,500,000**	**Various**	**A-17, M-39**

FAA Strategic Goal: Increased Safety - Reduce commercial air carrier fatalities

Description of Problem: Present automation hardware and software technology capabilities must be enhanced to adequately and effectively capture, disseminate, and analyze a wide range of safety related and security data. Many program managers, accident investigators, inspector personnel, security personnel, support personnel, and others who need the information must use inefficient or non-integrated procedures for planning, scheduling, capturing, and tracking work programs, investigation results, and safety and security information. The Regulation and Certification Infrastructure for System Safety (RCISS) improves inspection, surveillance, certification, and investigation programs and the safety and security missions by integrating safety data and information by using automation, information architectures, data management, and other technologies that are cost effective and in line with industry standards.

Description of Solution: This program consolidates all previous Information Technology (IT) infrastructure programs that supported the Associate Administrator for Aviation Safety's (AVS's) safety workforce. It will also expand and enhance the current AVS infrastructure while leveraging components across the AVS services. RCISS provides all IT infrastructure components to AVS's safety workforce, ensuring standard and reliable accessibility to safety data. The program will design and deploy the next generation infrastructure to meet AVS's business needs through addressing its mobile safety workforce needs and changes in the aviation industry. The program will focus on providing safety data to the AVS workforce while they are mobile (off-site) and conducting safety inspections and investigations of airlines, manufacturers, pilots, accidents, etc. RCISS's enterprise infrastructure will provide the access methods to all AVS national safety applications developed by Safety Approach for Safety Oversight (SASO), Aviation Safety Knowledge Management Environment (ASKME), Aerospace Safety Information Management (ASIM), and all other national safety programs developed or currently deployed within AVS.

Over the course of the next several years the RCISS program will design and implement a new enterprise infrastructure that encompasses the following six key components:

1. Devices for AVS's 5,000+ Safety Workforce (including new mobile devices) – Activities will include lifecycle replacement and procurement of new devices.
   - Provides new equipment designed to meet operational demands.
   - Replaces outdated or malfunctioning devices.

2. Communications (LAN, WAN, and VPN) - Activities will include lifecycle replacement and procurement of new equipment and services.
   - Improves accessibility and speed in utilizing national safety systems.
   - Provides new services for the transmission of safety data.
   - Replaces outdated or malfunctioning equipment.

3. Enterprise Services (Hardware and Software which allow components of the infrastructure to work together) - Activities will include lifecycle replacement and procurement of new devices and software.
   - Improves management and operation of the infrastructure through enhanced monitoring, consolidation of equipment and data collection.
   - Improves infrastructure reliability.

4. Application Data Servers (Hosting of national AVS safety applications) - Activities will include lifecycle replacement and procurement of new servers.
   - Begin the process of designing and planning the implementation of the application servers, which will support the future AVS safety systems.
   - Replaces or upgrades outdated or malfunctioning servers.

5. COTS Software (Operating System Software, Database Software) - Activities will include upgrade of software licenses.
   - Ensures continued vendor support for software.
   - Maintains ability to efficiently inter-operate with external infrastructures, e.g., other FAA organizations and the airline industry.
   - Evaluate future software to support safety workforce, enterprise management services and all other aspects of the infrastructure.

6. Contractor Support - Activities will include assistance in designing the RCISS enterprise infrastructure.
   - Provides specialized technical expertise in the design and development of select component areas, e.g., wireless and enterprise architectural design.
   - Provides specialized training to support the implementation of new infrastructure components.

The RCISS infrastructure directly contributes to the success of AVS in meeting its mission goals when it is developed, implemented and administered as a single system. The infrastructure will become most effective in supporting the safety workforce when all of its components are optimized.

For FY 2010, $10,500,000 is requested to provide technical refresh of equipment for the existing infrastructure as it continues to develop and implement IT services. The RCISS program will continue to deploy these IT new services in the following areas:

- Handheld Devices
- Remote Connectivity Telecommunications
- Consolidated Server/Storage Area Network (SAN) system
- Enterprise Software
- Disaster Recovery

These services will ensure continuity of operations for critical and non-critical safety systems. Additionally, these services will ensure critical safety data are safeguarded against loss by providing a secure, reliable and timely back up of data. These new services will support the coming integration of AVS's safety data when data are no longer associated with a system. In this new environment, safety workers will assemble data as needed from various data sources to support new business processes. Data in these data stores will require critical recovery response.

Benefits: Disaster recovery will develop enterprise-wide recovery strategies thereby mitigating risk of an aviation accident occurring as result of disruptions to safety information. This benefit correlates to the PRM Measurement Area "Processes and Activities," Measurement Grouping "Productivity.

Workforce Mobility benefits will support the FAA Flight Plan's Organizational Excellence goal. This benefit area will enhance the workforces' ability to operate in a mobile environment by deploying mobile handheld devices. RCISS will develop and implement an enterprise-wide mobile solution to mitigate the risk of an aviation accident occurring as a result of inefficient access to safety oversight capabilities. This benefit ties directly to PRM Measurement Area "Processes and Activities," Measurement Grouping "Productivity."

Data Warehouse Analysis and Reporting benefits will provide for an integrated data access across the AVS organization by providing access to centralized databases and systems. This benefit correlates to the PRM Measurement Area "Technology," Measurement Grouping "Interoperability.

E-Gov will expand communications between AVS and external users by allowing connectivity through proper devices and software. This benefit correlates to PRM Measurement Area "Technology," Measurement Grouping "Interoperability"

Initiative Enabler benefits will support the FAA Flight Plan goals of Increased Safety and Organizational Excellence. Specifically, RCISS will enable some of the benefits promised by the SASO and ASKME programs. The data developed, manipulated, analyzed, and reported on by the SASO and ASKME programs will reside on the RCISS IT infrastructure. Without that infrastructure, the full realization of SASO and ASKME capabilities could not occur. This benefit correlates to PRM Measurement Area "Technology," Measurement Grouping "Interoperability."

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$267,911.4 [1]
FY 2009 Appropriated	---	18,900.0
FY 2010 Request	---	10,500.0
FY 2011-2014	---	57,500.0
Total	Various	$354,811.4

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Hardware/Software System Design/Development	Various	$10,500.0

[1] Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 106-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
3A03	**Logistics Support Systems and Facilities (LSSF)**	**$9,300,000**	**Various**	**M-21**

Flight Plan Goal #2 – Greater Capacity

Objective #1 – Increase capacity to meet projected demand and reduce congestion. Improve NAS supply chain operations through modernization of the supply chain infrastructure.

Description of Problem: The Logistics Inventory System (LIS) is a legacy mainframe application that lacks the capability and flexibility to accommodate the current and future supply support needs to maintain the National Airspace System (NAS). If the FAA continues to operate with the current LIS system, the 2009-2013 flight plan goal of increasing capacity to meet projected demand and reduce congestion is at risk of not being met. The acquisition of new, complex NAS equipment, the requirement to support existing legacy systems, and the projected impact of implementing NextGen will increase the demand on the supply chain and maintenance operations for support services through the foreseeable future. The LIS program is currently operating beyond its original estimated life-cycle and is becoming cost prohibitive to maintain as the FAA modernizes its systems and migrates from the legacy mainframe environment to more robust client/server based applications.

The FAA supply chain currently maintains records for the assets required to support the NAS in several independent systems: FAALC Warehouse Management System (WMS), Field Spares Inventory (FSI), and the Automated Inventory Tracking System (AITS). This decentralized management of assets within the agency continues to impede the ability of the FAA to support the NAS in a timely and cost effective manner. Asset tracking is the most fundamental and critical element of any supply chain system. The inefficiencies in current operations have resulted in the inaccurate computation of spares inventory required by the FAA supply chain. These inaccuracies have led to costly expense for new spare acquisitions that could otherwise be supported by existing repair capabilities, redistribution or fabrication. These issues can and will lead to critical outages resulting in delays for the aviation public, inefficient use of funds, improper sparring levels in the field, and inefficient use of manpower resources.

Description of Solution: For FY 2010, $9,300,000 is requested for COTS software system integration and to build interfaces to other FAA and external FAA systems.

The Logistics Center Support System (LCSS) will implement the latest in supply chain management philosophy and technology by utilizing Commercial-Off-The-Shelf (COTS) software packages. In addition, to gaining the technological benefits associated with adopting object oriented software design, service oriented architecture (SOA), relational databases and a web-based user interface; this system will provide the robust operational business practices and industry standard business processes to the FAA needed to support the NAS and meet the objectives outlined in the flight plan. LCSS will be implemented in two segments; Segment 1 will be a prototype of the proposed software solution and Segment 2 will result in the full implementation of the COTS software solution and integration with existing support applications.

The LCSS program will be directly integrated with several other FAA initiatives to facilitate a comprehensive NAS supply support solution (i.e., 2D barcoding, RMLS, iLOG, etc.). The 2D barcoding effort was implemented for the purpose of tracking assets as they move throughout the FAA supply chain. Remote Monitoring and Logging System (RMLS) is the newly implemented field maintenance system solution intended to track all field activity associated with maintenance on NAS equipment at an operational facility. The data developed and maintained by the 2D barcoding effort, RMLS, and others will be integrated with LCSS to provide a comprehensive supply support solution. The Integrated Logistics (iLOG) board is implementing newly developed supply chain policy in order to transform the FAA supply support structure into a more proactive and efficient environment.

Benefits: This program will work to control costs while delivering a greater capacity. Through LCSS, the FAA will save an estimated $218 million, with a cost-benefit ration of 2:1 based upon initial investment decision data. The benefits result from initial and inventory replenishment spares reductions, increased repairs under warranty, reductions expected in shipping/handing, space and utilities.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$73,242.4
FY 2009 Appropriated	---	9,300.0
FY 2010 Request	---	9,300.0
FY 2011-2014	---	12,300.0
Total	Various	$104,142.4

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. System Engineering	---	$4,876.0
2. Program Management	---	1,730.0
3. HD/SW Design/Dev/Procurement/Production	---	1,763.0
4. Test and Evaluation	---	217.0
5. Data and Documentation	---	226.0
6. Implementation	---	488.0
Total	1	$9,300.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
3A04	**National Airspace System (NAS) Recovery Communications (RCOM)**	**$10,230,000**	**Various**	**C-18**

Flight Plan Goal #4: - Organizational Excellence

Objective #1: - Support and implement U.S. security strategies and plans related to transportation.

Description of Problem: The Command and Control Communications (C3) program provides the FAA the minimum command and control communications capability necessary to direct the management, operation, and reconstruction of the National Airspace System (NAS) during local, regional, or national emergencies when normal common carrier communications are disrupted. The C3 program provides minimum capabilities for Continuity of Operations (COOP) for the FAA. Where applicable, C3 is an OMB SAFECOMM compatible program that encompasses multiple independent procurement projects, which are currently at various stages in the acquisition lifecycle.

In 1995, the National Telecommunication and Information Administration (NTIA) required a decrease in the frequency bandwidth used by the current VHF-FM network. As a result, the older VHF-FM radios that are configured to the outdated frequency separation requirements may no longer be utilized. In addition, the current system lacks coverage and integration with current VHF/FM equipment. This makes it difficult, and often impossible, to communicate over long distances. Network hardware has been fielded for approximately 20 years, long past its expected life cycle. For example, the cost to repair one module is more than the purchase of a new modern radio, yet for compatibility reasons, the repair of outdated equipment is continued. There is also a need to solidify the command and control communications within the Alaska Region.

Other efforts within the C3 program also revolve around National Security and are classified. There are several operational command and control centers within the Washington area and other sites around the country that require modernization. Since September 11, 2001, the C3 program has had its responsibilities increased to meet the current national security demands.
Additionally, there is a continued requirement for secure fax, secure telephone and secure conferencing capabilities.

Description of Solution: For FY 2010, $10,230,000 is requested as following:

- $5,700,000 to continue procurement of VHF/FM radio equipment supporting the modernization of the current VHF/FM network. Existing regional networks will continue to operate in the 25 kHz mode until all antiquated infrastructure equipment has been replaced with 12.5 kHz equipment.
- $1,000,000 to fund Emergency Operations Network (EON) to purchase and install a global load balancer, a Storage Area Network (SAN), and a virtual server platform including additional hardware (servers, switches, cable) for remote sites. These new systems will require installation of new software packages.
- $2,300,000 to fund other critical emergency communications, including HF radio equipment, secure communication equipment (such as secure conference bridge), automated notification system replacement/upgrade, Communication Support Team (CST) replacement and satellite communication.
- $1,230,000 to support other C3 efforts and supporting tasks to comply with NCS 3-10 requirements.

Benefits: The new C3 equipment directly benefits the FAA in the form of lowered periodic and correctional maintenance costs of the old and technologically obsolete C3 equipment in the field. The C3 program also provides the FAA with OMB/DHS SAFECOM compatible emergency communication systems, ensuring interagency interoperability.

The C3 program office provides critical communications for both daily NAS operations and disaster/crisis management by providing:

- Increased command and control by national leaders in the FAA and other agencies.
- Quicker response to natural and wartime disasters thereby helping avoid loss of life and property.

- Increased efficiency of flying time by FAA flight inspection aircraft and other public and private aircraft
- Ensure COOP will be maintained.
- OMB/DHS SAFECOM compatibility

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2009)	---	$98,190.3 [1]
FY 2010 Appropriated	---	10,000.0
FY 2011 Request	---	10,230.0
FY 2012-2015	---	48,000.0
Total	Various	$166,420.3

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Radio Equipment Purchase	---	$10,230.0

[1] Includes $10,340 reduction of FY 2001 funds pursuant to rescission contained in P.L. 106-544. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L.108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
3A05	**Facility Security Risk Management**	**$18,000,000**	**Various**	**F-24, M-08**

FAA Strategic Goals: Homeland and National Security -– Balance homeland and national security transportation requirements with the mobility needs of the Nation for personal travel and commerce. Objective 1 - Support and implement US security strategies and plans related to transportation

Description of Problem: The FAA staffed facilities are vulnerable to outside intruders, and existing security vulnerabilities jeopardize air traffic services critical to the National Airspace System. Employee and user security is critically dependent upon an operational and administrative environment that provides reasonable safeguards against these types of disruptions. Homeland Security Presidential Directives (HSPD) 7, Critical Infrastructure Identification, Prioritization and Protection mandates that agencies identify, prioritize, and coordinate the protection of critical infrastructure and key resources against terrorist acts.

Description of Solution: All FAA staffed facilities must be secured. FAA has assessed physical security risks and prioritized corrective actions based on the threat to the facility. The Facility Security Risk Management (FSRM) program has ongoing activities to reduce these risks. These activities include reducing the risk of intrusion and unauthorized entry by installing surveillance, intrusion detection, and access control systems. Other improvements include controlling parking, fencing, lighting, occupant emergency plans, intelligence sharing, physical barriers, shipping and receiving upgrades, and employee and visitor identification.

For FY 2010, $18,000,000 is requested to support the following upgrades:

- Phase 1 Site Survey/Engineering Design at one Large TRACON,
- Phase 2 Construction/Equipment Installation at one Large TRACON,
- Security upgrades at 20 Security Level 1 and Security Level 2 Facilities,
- Perimeter Hardening at 22 ARTCCs.

Benefits: The FSRM program reduces the risk of unauthorized access to FAA staffed facilities. The FAA has completed upgrades and accredited 895 facilities, which protect employees, facilities, and assets of FAA's critical infrastructure. The FAA personnel security awareness has increased through the FSRM program, and the program also supports the FAA's response to Homeland Security Presidential Directives (HSPD) 7, 12 and 16.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$217,500.0 [1]
FY 2009 Appropriated	---	15,000.0
FY 2010 Request	---	18,000.0
FY 2011-2014	---	84,400.0
Total	Various	$334,900.0

[1] Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Site Preparation/Construction	---	$5,220.0
2. A&E Design	---	360.0
3. Implementation	---	5,040.0
4. Security Systems Equipment Acquisition	---	4,950.0
5. Program Management	---	2,430.0
Total	Various[1]	$18,000.0

[1] Sites are subject to change. Facilities assessed and found to have "high" risk will receive security upgrades before facilities with lesser risk.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
3A06	**Information Security**	**$12,276,000**	**Various**	**M-31**

FAA Flight Plan Goal 6 – Organizational Excellence

FAA Objective 4 - Make decisions based on reliable date to improve our overall performance and customer satisfaction.

FAA Performance Target 4 – Achieve zero cyber security events that disable or significantly degrade FAA services.

Description of Problem: The FAA must ensure the integrity and availability of all its critical information systems, networks, and administrative systems under conditions of increased cyber terrorism and malicious activities by hackers and other unauthorized personnel. In the Homeland Security Presidential Directive/HSPD 7, FAA was directed to protect and ensure the integrity, confidentiality, and availability of all National Airspace Information Systems as well as federal information. Under the Federal Information Security Management Act (FISMA) of 2002, FAA must ensure that all information systems identify and provide information security protection equal to the risk and magnitude of the harm resulting from unauthorized access, use, disclosure, disruption, modification, or destruction of information that support the agency, aviation safety and security, and the NAS.

The FAA Cyber Security program is a partnership between the FAA Chief Information Officer (CIO) organization and FAA lines of business and staff offices (LOBs/SOs) with a focus on protecting our information technology (IT) infrastructure. The program is comprised of the following areas: Cyber Security Management Center (CSMC); IT and ISS awareness and training; IT research and development (R&D); policy, standards, and requirements; program evaluations; and system certification and compliance. This comprehensive Cyber Security effort offers information security awareness training of the agency's key ISS personnel, development and evaluation of policies and standards, formulation of system requirements, certification of systems and ensures their compliance with federal regulations, protection of FAA's computer enterprise, and response to computer security incidents.

Bravo events are targeted attacks on federal government systems, which pose a serious and imminent threat to those systems. These are events specific in nature, objective and patterned. They, by design, reflect hostile intent. Understanding all aspects of these events dictates that they be detected and prevented to the maximum extent to which the FAA is capable. The development of the term "Bravo" was initiated as an indirect route to allow the communication of these events and the identification and mitigation of systems that have been compromised or affected by these sophisticated attacks.

The office of the Chief Information Officer (AIO's) work continues with a strategy, which is a comprehensive, proactive approach to preventing and isolating intrusions in the agency's computer networks. This cyber defense strategy involves hardening of the individual system and network elements, isolating those elements and backing up those elements to avoid services disruptions.

Description of Solution: Enhance the NAS architecture to include cyber security; harden individual NAS systems and network elements by completing remediation for the discovered vulnerabilities in each of the Nation Airspace Systems; enhance boundary protection to NAS facilities; improve recovery rate during times of cyber attacks through information sharing from the FAA Cyber Security Management Center (CSMC); conducting systemic monitoring at the CSMS, and addressing the challenge of providing cyber protection while maintaining reliability, availability and integrity through applied research and development initiatives. The safety-critical aspect of NAS operations leads to stringent requirements for reliability and availability, resulting in extensive use of system and equipment redundancy, path diversity, and software diversity. Mandated high integrity, increases the time and cost to design, develop, and verify NAS components during initial deployment, routine upgrades, and emergency patches. At the same time, FAA is under pressure to deploy cost efficient new systems that meet stringent safety and security targets. This creates a challenge to reduce the time and cost to deploy high integrity systems to the U.S. national airspace, while at the same time enhancing confidence in the safety, security, and reliability of these systems.

MANDATE:

- Homeland Security Presidential Directive/HSPD-7
- Homeland Security Presidential Directive/HSPD-12
- Executive Order 13231, Critical Infrastructure Protection in the Information Age
- National Institute of Standards and Technology (NIST) 37
- Federal Information Security Management Act, OMB M-03-19
- OMB Circular A-130

For FY 2010, $12,276,000 is requested to support the following:

REMEDIATION
Correct NAS system vulnerabilities discovered during prior year Security Certification and Authorization Packages (SCAP). Once an information system is accredited, it must undergo an independent risk assessment or an annual self assessment based on the guidelines provided by NIST SP 80026 to determine the current status of their information systems. Where necessary, the ISO must develop a plan of action and milestones (POA&M) describing the security measures that are planned or currently implemented to correct deficiencies noted during the assessment of the information system.

NAS ISS SECURITY TRANSFORMATION
The FAA will complete concept of operation and implement strategy for automated recovery, which involves isolating those systems that have been affected by a virus, instituting the fix, and making sure that, affected systems get back online as soon as possible. Architecture and engineering efforts for alternative solutions to secure new NAS system will be developed (NSure concept). The NAS information technology systems will be monitored and all necessary actions will be taken to ensure the systems are not interrupted and are available at all times. Acquire and implement enhanced tools to be used by the Computer Security Incident Response Center to address complex and rapidly changing cyber threats and vulnerabilities. These would include analysis of NAS Netflow data, modeling and simulation of attack vectors into the NAS, data clustering and early indications and warning. Also develop the capability to do predictive analysis of events that could cause a service outage to the NAS. Funds are also required to begin to examine the ISS requirements of a space based NAS.

Essentially, securing automated resources thru two factor authentication is an imperative for the FAA to reliably and securely provide Air Traffic Management (ATM) services to: (1) collect, process, store, and exchange sensitive and critical administrative, support, and operational data without unauthorized access, disclosure, or corruption and (2) protect, from service disruption, the information systems and technology that accomplish those tasks. If logical resources cannot be adequately and efficiently secured, the mission and goals of the FAA are at risk.

IPv6 TRANSITION
The Office of Management and Budget (OMB) has directed all Federal Agencies to develop a strategy and plan using, "The Business Case and Roadmap for Completing IPv6 Adoption in the US Government. IPv6 integration must be prioritized at the agency level and executed in a well planned, phased approach with success criteria measurements and alignment with other key government initiatives like TIC, HSPD-12, FDCC, NETWORX, DNSSEC and the IT Infrastructure Line of Business (ITI LoB). Agency must have an IPv6 segment operational no later than FY 2012 and support both IPv4 and IPv6 segments during application and system transition. Develop plans and provide management support to integrate the network connections from the Lines of Business and Staff Offices into the FAA IPv6 compliant backbone, applications and systems.

Trusted Internet Connections (TIC): The TIC initiative requires a reduction in external connections, including internet points of presence. Agencies must comply with critical TIC technical capabilities, continue reduction and consolidation of external connections to identified TIC access points, execute a MOA and SLA between DHS and agency CIO. The TIC load sharing strategy, plan and design must be developed and managed to meet OMB guidance. Einstein II deployment at each of the consolidated IAPs must be planned, coordinated and installed.

Federal Desktop Core Configuration (FDCC)
Ensure that government application operate correctly on Windows XP and Windows Vista computer systems configured with FDCC. Conduct FDCC compliance testing and ensure the use of a SCAP-validated tool with FDCC Scanner capability to baseline the configuration, test common use cases (per normal processes), and to ensure the FDCC settings and patches are intact.

ENTERPRISE ARCHITECTURE/INTEROPERABILITY
The FAA is continuing to refine its enterprise architectures and wants to ensure that it is interoperable with the enterprise architectures being developed by other entities. The FAA is also integrating enterprise architecture into its investment processes to help FAA senior management make better informed decisions.

Enterprise Architecture: Continue to enhance the FAA's enterprise architecture and solutions architecture ensuring that the Administrative, NAS-Support and the NAS architecture, defined by the Next Generation Air Transportation System (NextGen) program, "to be compatible and meet the agency's future requirements. Opportunities to leverage architectural products to reduce costs and improve efficiency will be pursued including the development and enhancement of investment roadmaps.

Information Architecture: Develop and maintain the necessary information architecture to seamlessly share information between the agencies participating in the NextGen architecture, formalize agreements and develop policies to foster the transfer of necessary information between Government agencies and commercial entities. Support the SWIM program and other NAS program's data architecture efforts.

TECHNOLOGY INSERTION
Although commercial research and development can be leveraged to meet the IT and IT security needs of the FAA, certain capabilities associated with the FAA's mission must be acquired. These funds ensure that the FAA's operational requirements are satisfied and that new capabilities are available in the correct timeframe, while maintaining required information security.

Academia and NSF Technology
Continue to collaborate with the National Science Foundation, Universities and others Government Agencies to sponsor research on promising IT and IT Security technologies that meet FAA requirements and FAA can transition into operational networks to increase capabilities, mitigate risks, and/or reduce operating costs.

Technical Center
Provide continuing support for a rapid prototyping laboratory established at the William J. Hughes Technical center (WJHTC) for the purpose of developing secure mobile solutions for aircraft and administrative uses. The lab supports rapid configuration changes for the purposes of vendor evaluation, system architecture development, security architecture development and general research.

Advanced Concept Technology Demonstrations
Partner with DOD and participate in Advanced Concept Technology Demonstrations (ACTD). These demonstrations and experiments are designed to leverage existing technology and demonstrate its applicability to meet ongoing operational requirements. Artifacts from the demonstrations will be transitioned into FAA networks and facilities.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$106,712.4 [1]
FY 2009 Appropriated	---	12,000.0
FY 2010 Request	---	12,276.0
FY 2011-2014	---	48,000.0
Total	Various	$178,988.4

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Information Security	---	$12,276.0

[1] Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
3A07	**System Approach for Safety Oversight (SASO)**	**$20,000,000**	**Various**	**A-25**

Flight Plan Goal #1 - Safety

Objective #1: – Reduce the Commercial Airline Accident rate.

Objective #2: – Reduce the number of fatal accidents in general aviation.

Description of Problem: The White House Commission on Aviation Safety and the National Civil Aviation Review Commission determined FAA's regulatory and certification programs should be re-engineered to achieve a reduction in aviation accidents. These two aviation safety-related commissions recommended that the FAA conduct certification and oversight of all companies performing aviation safety functions, including repair stations located out of the United States. They further recommended that the FAA be more vigorous in applying high standards for certification and in using emerging technology, safety reporting, and risk management concepts to help identify aviation safety problems before they result in accidents. Additionally, growth and enhancements to the National Airspace System will introduce a host of new tracking and communications systems, with satellite, ground, and aircraft components. These in turn will introduce new operational procedures and training requirements. The Flight Standards Service (AFS) will need to revise its surveillance and certification procedures to reflect these changes.

Description of Solution: Through the SASO Program, the Flight Standards Service will develop and implement a new proactive system safety approach to help identify, regulate, comply, and manage safety risks to eliminate accident causal factors in the aviation industry. FAA is currently attempting to resolve the reactive, compliance only nature of its oversight activities with a shift to a proactive approach. A system safety approach would go beyond compliance to identify system-wide safety hazards prior to their occurrence. It entails developing business models, collecting and sharing quality data, and developing new analytical methodologies to assist Aviation Safety Inspectors in conducting their oversight job tasks. Within this framework, FAA must also integrate human factors considerations, promote information sharing with the aviation community, and allow for continuous improvements that keep pace with and utilize advances in technology.

For FY 2010, $20,000,000 is requested to continue the re-engineering of AVS business processes and develop integrated, comprehensive system safety business applications. Specific efforts will continue to focus on conducting a complete analysis of current certification and surveillance processes. This will provide the basis for improved procedures, which will aid in the determination of the software tools and databases required to support the processes. Although Information Technology (IT) is only one component of the SASO solution, it represents a significant portion of the SASO investment. This request complements the SASO funding appropriated in the FY 2007 Operations account. Existing AFS systems support a compliance-based approach to surveillance, certification, enforcement, and investigation. SASO is responsible for coordinating the realignment of those systems to a system safety approach. To address these problems, SASO has created an IT solution based upon e-Gov principles that integrates government and Industry safety systems and data in a virtual extranet architecture. A core set of "system-safety-based" applications will be developed that can be used by both Industry and the FAA to manage and oversee safety. This core set of applications will provide a common yardstick for measuring aviation safety.

Benefits: This program will produce safety business applications that identify and eliminate causal factors of commercial and general aviation accidents. Information sharing with the air transportation industry will improve the oversight process, which increases the FAA's effectiveness in mitigating or preventing aircraft accidents. The combination of business process re-engineering and the integration of better job performance aids will ensure a more efficient workforce performing certification and surveillance activities.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$37,700.0
FY 2009 Appropriated	---	14,300.0
FY 2010 Request	---	20,000.0
FY 2011-2014	---	97,200.0 [1]
Total	Various	$169,200.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Requirements Analysis	Various	$20,000.0

[1] Future requirements are based on activity levels that are validated on a year-to-year basis.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
3A08	**Aviation Safety Knowledge Management Environment (ASKME)**	**$8,100,000**	**Various**	**A-26**

FAA Strategic Goal: Increased Safety - Reduce commercial air carrier fatalities

Description of Problem:
Within the FAA's Regulation and Certification (AVS) organization, the Aircraft Certification Service (AIR) is responsible for developing, administering, and ensuring compliance to safety standards governing the design, production, airworthiness, and continued operational safety of civil aircraft and related components. Essentially, AIR is responsible for ensuring that civil aircraft are designed and built to operate safely within the National Airspace System (NAS).

In carrying out their responsibilities, FAA personnel perform numerous business activities that generate massive amounts of data and information used in making strategic aviation safety decisions. The data is also used throughout AIR to ensure standardized regulatory compliance, workforce education, trend analysis, and program reporting. As the aviation industry has grown in size and complexity, so has the requirement for additional resources to perform these services. Between FY 1992 and FY 2000, the AIR workload increased 40 percent while the number of engineers, inspectors, and support staff grew by only 24 percent. Additionally, within AIR, new security requirements related to terrorist countermeasures have surfaced as a result of the September 11, 2001 terrorist events. Many of those requirements are not yet fully realized.

The ability of AIR to remain responsive to industry growth will be impaired without maximizing the use of automation. The lack of a comprehensive system with new processes and automation would mean AIR would be unable to use information technology to modernize its business practices and maximize the productivity of its workforce. Delays to certification programs, release of new policies and guidance, designee approval or renewal, and response to inquiries will have a long-term detrimental effect on the vitality, safety, and efficiency of the aviation industry.

Without a comprehensive automated system to provide a corporate view of resource utilization, AIR and industry personnel will continue to be dependent on time-consuming, labor-intensive manual processes to store and retrieve required paper documents. Because current paper-based filing systems are local, it will remain difficult for AIR to have single-source information shared among geographically dispersed organizations to ensure consistency of policy application.

Without automated process assistance tools and the ability to provide current and accessible information, designee program effectiveness will be minimized, designees underutilized, and AIR designee oversight and evaluation will be deficient.

Without the ability to capture and manipulate its knowledge base, AIR will continue to lose the corporate history of past decisions, and be unable to provide reliable substantiation of previous decisions when requested to identify inconsistent or contradictory information.

Without integrated and automated tracking and work measure tools, AIR will not gain the ability to conduct long-term strategic analysis for better decision-making on resource allocation and direction.

Description of Solution: For FY 2010, $8,100,000 is requested to fund the following ASKME requirements:

- Electronic Filing Service - EFS – Historical scanning activities - first year.
- Work Tracking Software-Risk Based Resource Targeting - WTS-RBRT – Completion of development; Deployment of solution for the RBRT Sub-Function.
- Monitor Safety Related Data - Oversee System Performance - Internal & External - MSRD-OSPi and OSPe - Complete documentation of detailed system requirements; Begin Design and Development activities for the OSPi Sub-Function.

- Assimilate Lessons Learned - ALL – Complete development activities and deploy solution for the ALL Sub-Function based on requirements gathered.
- Designee Supervision / Past Performance Sub-Function - DS/PP – Complete development activities and deploy solution for the DS/PP Sub-Function.
- Work Tracking Software - Work Activity Tracking - WTS-WAT – Document detailed system requirements.

The FAA will develop an Aviation Safety Knowledge Management Environment (ASKME) to provide a system for electronically storing FAA technical documentation and lessons learned identifying aircraft design and manufacturing safety issues so that they can be found, accessed, and shared more easily. This technical data includes the rationale for design and production certification decisions, interpretations of rules and policies, and audits of aircraft industry manufacturers. In addition, ASKME will provide tools to improve the ability to identify potential unsafe conditions by analyzing this documentation along with safety information such as Service Difficulty Reports, NTSB safety recommendations and reports, accident reports, and Maintenance Difficulty Reports. Finally, ASKME will provide electronic tools for capturing key safety related data resulting from during its standard business activities for rulemaking and policy development, airworthiness directives, design certification, production/manufacturing certification, airworthiness certification, designee management, evaluation and audit, external inquiries, enforcement, continued operational safety management, and international coordination.

ASKME is a suite of information technology (IT) tools designed to support and enable the Aircraft Certification Service (AIR) to meet specific FAA goals of Safety, Organizational Excellence, and International Leadership. AIR is an organization within the Agency's line of business known as Regulation and Certification (AVS).

The mission of AVS is to promote aviation safety in the interest of the America public by regulating and overseeing the civil aviation industry. AIR is specifically responsible for establishing safety standards governing the design, production quality, airworthiness of civil aircraft products, and the continuing airworthiness of aircraft. AIR issues and maintains certificates for design and manufacture of aircraft, aircraft engines and propeller, materials, parts, and appliances. AIR uses industry-paid staff called designees to assist industry companies to prepare for and maintain their certifications. AIR manages designee qualifications, appointment and monitoring. AIR monitors safety performance by conducting reviews of aviation products and reviewing safety data for trends; conducting safety inspections and surveillance; investigating possible violations and initiating enforcement actions; and participating in accident and incident investigations. Fundamentally, AIR's criticality to the airspace is the responsibility for ensuring that civil aircraft are designed and built to operate safely within the National Airspace System (NAS).

While AIR has approximately 1,100 staff and 5,000 designees (representatives that act on behalf of the FAA to perform certification-related activities), the business challenges associated with meeting the agency goals (Safety, Organizational Excellence, International Leadership) require AIR to adopt and implement innovations in IT, hence the requirement for ASKME.

ASKME will:

- Implement a proactive safety management system. This system is designed to identify and address safety risks and accident precursors throughout the product lifecycle of design, manufacturing, operations, and maintenance, as well as build into the safety management process, automated lessons learned feedback mechanisms. The risk assessment performed on the safety data may be used for risk management analysis, root cause analysis, corrective action, and follow-on work in the areas of standards, certification, maintenance, and operations.
- Provide comprehensive, real-time, organization-wide access to current and historic digital and paper-based documentation aimed at supporting effective and timely decision-making in standards, certification, and continued operational safety.
- Enable real-time collaboration among AIR technical staff, industry, international aviation agencies, applicants, approval holders, and designees to facilitate effective and timely decision-making.
- Automate the integration of risk management processes into standards development, certification, and continued operational safety.
- Provide tools to assist with designee oversight and delegation in certification through the use of automated risk management tools.
- Provided tools to enhance resource utilization and performance management and monitoring.

When integrated into our safety management approach and practices, these combined capabilities will enhance aviation safety and promote a culture of system safety.

In order to accomplish the objectives, the ASKME suite of tools will provide the following:

- Web-based knowledge management portal designed to store AIR's valuable knowledge assets, making them accessible, facilitating management and workforce decision-making, providing a proactive systems safety approach, and improving overall productivity and customer- and citizen-based satisfaction.
- Collaboration tools to facilitate real-time communications, decision-making, and management between AIR, FAA Designees, and aviation industry Applicants, as well as its domestic and international partners. This collaboration capability will enhance identification, analysis, management, and resolution of safety issues; certification and production approvals; as well as oversight of designees. The tools will also support real-time collaboration between AIR and international civil aviation agencies to facilitate decision-making during accident response and regulatory development, allowing for real-time exchange of accident/incident information and aviation supplier audit information with other countries.
- Predictive safety data analysis tools designed to support the full range of continued airworthiness analytical activities from safety data identification/collection, risk assessment, and risk management, to prescription of corrective action, monitoring, and feedback. The tools will provide the capability to access and analyze accident/incident data to enable recognition of potential safety problems and development of solutions or intervention strategies. The tools will also provide the capability to integrate and analyze compliance, production, operations, oversight, and regulatory data and information to aid in identifying potential safety risks, develop new regulatory material, and approve design modifications. Finally, the tool will support the application of risk management tools to elements of the safety continuum, where applicable.
- Integrated data management and reporting tools to support a standard and integrated data management architecture that can facilitate agency and aviation industry-wide data collection and information sharing.

<u>Benefits:</u> ASKME is a key initiative in the FAA. ASKME maps to the FAA's strategic plan goals for FY 2003-2007 and the FY 2004 - 2008 Flight Plan.

It is specifically linked to DOT and FAA goals as follows:

DOT Goal/Safety/Reduction in transportation-related deaths; Reduction in transportation-related injuries: By 2008, reduce commercial aviation fatal accidents to 0.01 per 100 thousand departures; and reduce general aviation fatal accidents to 325.

FAA 2006 - 2010 Goals/Strategies/Targets:

<u>Goal 1: Increased Safety - To achieve the lowest possible accident rate and constantly improve safety.</u>

Objective 1: Reduce commercial airline accident rate.
Target: Reduce the three year rolling average fatal accident rate below 0.010 per 100,000 departures by FY 2010.

- AIR is responsible for ensuring that civil aircraft are designed and manufactured to operate safely within the National Airspace System (NAS). ASKME will provide the automated systems to conduct safety data analysis, data gathering, as well as the collection of lessons learned as it applies to AIR's safety-related responsibilities (e.g. aircraft certification and certificate management, regulatory development, designee supervision and oversight, and continuous operational safety). Jointly these systems will provide AIR with a comprehensive mechanism aimed at: 1) the early identification and resolution of accident precursors; 2) the promotion of systematic and structured risk assessment/risk management practices; and 3) the proactive management of safety issues throughout the lifecycle of an aircraft and its components. The projected savings over the life of the program is estimated at 174 avoided fatalities and a total savings of $495 million (then year dollars at 80 percent high confidence level).

Objective 2: Reduce the number of fatal accidents in general aviation.

Target: Reduce number of GA and non-scheduled Part 135 fatal accidents to no more than 319 by FY 2009.

Target: Reduce accidents in Alaska for GA and all Part 135 operations to no more than 99 per year by FY 2009.

- ASKME's automated safety data analysis tools will help realize the vision of the AVS Certification Process Study (CPS) and help close the gap left on reducing the U.S. commercial fatal accident rate.

Goal 3: International Leadership - Increase the safety and capacity of the global civil aerospace system in an environmentally sound manner.

Objective 1: Promote improved safety and regulatory oversight in cooperation with bilateral, regional, and multilateral aviation partners.

Target: By FY 2010, reduce five year rolling average commercial air carrier fatal accident rate in key regions or countries experiencing substantial growth by 10 percent from 2000-2005 baseline.

- Bilateral, regional, and multilateral aviation partner's access to lessons learned from accidents. Presently, lessons are learned by the few within FAA intimately involved in the accident. The learning drops off exponentially from there. The lessons learned component of ASKME will allow us to make this information available to all our regulatory partners, so that they could also make providing evidence of learning these lessons a requirement for overseas industries.

- Through ASKME's state-of-the-art web portal and use of data feeds, the FAA will be able to push safety information (AIR-40 communications, regulations, orders, policy, guidance, airworthiness directives (ADs), etc) to our bilateral, regional, and multilateral aviation partners by allowing them to automatically receive specific safety information that AIR produces and is of interest to them.

- Bilateral, regional, and multilateral aviation partner's access to selected tools for Part 21, 23, 25 data, Equivalent Level of Safety memos, Special Conditions, Type Certificate Data Sheets (TCDS), etc.

Objective 2: Promote seamless operations and improved safety and regulatory oversight in cooperation with bilateral, regional, and multilateral aviation partners.

- AVS is planning for the sharing of international safety standards, safety and certification data in real-time, thereby enabling AVS to keep pace with the challenges associated with the ever-increasing globalization of aircraft design and manufacturing and the need for real-time partnership, collaboration, and decision-making. ASKME, through its knowledge management environment, will provide the capability to implement automation tools that will enable the FAA and its international partners including ICAO to conduct business, collaborate, and make decisions effectively and in real-time. Its offering as a "critical new technology" will help to attain the performance target of ensuring that key operational procedures are in place for these stakeholders/partners in a consistent and timely manner.

Goal 4: Organizational Excellence - Ensure the success of the FAA's mission through stronger leadership, a better trained workforce, enhanced cost-control measures, and improved decision-making based on reliable data.

Objective 3: Make decisions based on reliable data to improve our overall performance and customer satisfaction.

Target: By FY 2008, ensure that 90 percent of major system acquisition investments are on schedule and within 10 percent of budget by FY 2009.

- ASKME's analytical tools will provide the basis for AVS's technical staff to identify and preempt potential hazards and events through predictive analysis and subsequent decision-making and corrective action. Corrective actions will then be monitored to assess impacts to safety for further refinement of the risk management model. ASKME safety benefits are calculated at $495 million (determined based on if ASKME automation was in place at the time of the accident could causal factors associated with AIR business processes have been eliminated).

- The current and projected/future AIR workload exceeds workforce capability. ASKME business process tools will help AIR to streamline work activity and oversight practices. This will enable AIR technical staff to transfer non-safety critical work activities to its pool of designees. The work transfer will result in a future cost savings by allowing staff growth to be maintained at minimal levels. Further, the work transfer will enable AIR technical staff to focus more on safety identification, risk management, resolution, and improvement activities. Streamlining the AIR activities is estimated to result in an operational savings of approximately $118 million.
- A core concept of ASKME is the critical integration of people, process, and technology. When the three together can leverage the power that each have to offer, then a culture of knowledge and system safety can be created and sustained. ASKME true value will be derived from the integration of the tools into the business process whereby, the people will be able to provide the highest degree of service to its customers.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$10,778.0
FY 2009 Appropriated	---	7,900.0
FY 2010 Request	---	8,100.0
FY 2011-2014	---	54,900.0 [1]
Total	Various	$81,678.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Document Detailed System Requirements	---	$8,100.0

[1] Future requirements are based on activity levels that are validated on a year-to-year basis.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
3B01	**Aeronautical Center Infrastructure Modernization**	**$13,810,500**	**1**	**F-18**

Flight Plan Goal #4 – Organizational Excellence

Objective #2 – Control costs while delivering quality customer service.

Description of Problem: The Aeronautical Center Infrastructure Modernization program funds renovation and the replacement of major building systems not provided for by any other funding sources or lease agreements at the Mike Monroney Aeronautical Center (MMAC) in Oklahoma City. Funds are used for renovations that sustain and ensure facilities remain viable for present and future FAA employees, students, and contractors that support Air Operations, Engineering, Training (Radar/Navaids), National Airspace System (NAS) Logistics, and Business Services. Much of the infrastructure is fifty years old and in need of structural upgrade and/or renovation. Many NAS support functions are conducted in outdated structures and in some cases in buildings that do not meet current building codes. Deferring renovation and modernization of aging facilities has serious and costly consequences that include: leaking roofs, deteriorating plumbing, malfunctioning heating/ventilation/air conditioning systems and non-compliance with life safety codes, work disruption, cause NAS automation and technology failures, risk occupants' health and safety, cause loss of productivity and emergency repairs.

The addition of new equipment to FAA's inventory, coupled with existing NAS support requirements, increases the need to maintain suitable space at the Aeronautical Center that house critical mission support personnel. Renovation permits space efficiencies for additional functionality, personnel, and systems. There is a corresponding need for related Center infrastructure, such as storm sewers, water lines, and telecommunications.

Description of Solution: There are three primary segments to this program in FY 2010:

- Systems Training Building (STB) Phase II renovation construction: The STB was constructed in 1969 and has not had significant renovation. The basement houses NAS system training servers. The basement contains raised access flooring that has failed due to deterioration and fatigue. Using a phased approach, renovation will repair/replace the basement floor and interior walls, install fire suppression systems for fire egress and separation in open stairwells, provide funding for new boilers/chillers, upgrade electrical wiring, plumbing, insulation and new windows.
- Phase III storm sewer replacement construction: The current Aeronautical Center Storm Sewer system was constructed in the 1950s and is inadequate for the existing Center size and rainwater run off. An expanded system is needed to connect the existing system with buildings, parking lots, and structures built after the legacy infrastructure was installed and to correct flooding problems in the tunnels and in buildings constructed after 1958.
- The MMAC telecommunications backbone data network upgrades: Funding from this program will provide Cisco network updates to the Aeronautical Center backbone to provide redundancy, reliability, security and availability. Router backplanes will be replaced to support increased bandwidth needed by Data Centers and increasing user requirements. Hardware/software upgrades will support newer model telephones and replace old hardware. Single mode fiber will be provided to north center campus for increased redundancy of core routers on the network, and increase bandwidth to Data Centers and individual Aeronautical Center users.

For FY 2010, $13,810,500 is requested as following:

- $10,480,500 is requested for Systems Training Building renovation. Funding will provide for relocation of NAS systems, interior building partition wall replacement; replacement of ceilings, lighting and electrical systems.

- $2,500,000 is requested for Phase III storm sewer replacement, which will replace approximately 25 percent of the storm sewer system at MMAC. Funding provides for replacement of storm drain inlets (grates in curbs) and replacement pipes for greater water capacity.
- $830,000 is requested to upgrade the telecommunications infrastructure. Funding will provide for implementation of the Cisco network for Center redundancy, reliability, security and availability. Router backplanes will be replaced for increased bandwidth used by FAA data centers and personnel requirements. Funding will provide for hardware/software upgrades to newer model telephones and replace old hardware with current and single mode fiber for increased redundancy of core routers on the network.

Benefits: This program sustains the Aeronautical Center as '…US critical infrastructure' identified in Presidential Decision Directive (PDD) 63, also allowing compliance with Executive Order 13327 for the efficient/economical use of Federal resources to maintain Government facilities. Aeronautical Center facilities are cost effective, and lower in cost than comparable GSA metropolitan Oklahoma City leased facilities, FAA Headquarters, and other FAA facility locations. Renovation of Center facilities extends the useful life of renovated buildings by 25 years, ensuring a viable future for FAA at these facilities. In FY 2010, renovation improves facility space and energy utilization, reduces maintenance costs of major systems within renovated buildings, provides for incremental upgrades of telecommunications infrastructure, and improves productivity of personnel using renovated facilities through space efficiencies and improved environmental controls.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	127,300.4 [1]
FY 2009 Appropriated	---	13,500.0
FY 2010 Request	---	13,810.5
FY 2011-2014	---	41,700.0
Total	1	$196,310.9

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Systems Training Building (STB) Renovation Construction	---	$10,480.5
2. Storm Sewer Replacement, Phase III	---	2,500.0
3. Telecommunications Upgrades to Infrastructure	---	830.0
Total	1	$13,810.5

[1] Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
3B02	**Distance Learning**	**$1,500,000**	**Various**	**M-10**

Flight Plan Goal #4 – Organizational Excellence

Objective #1 – Make the organization more effective with stronger leadership, increased commitment of individual workers to fulfill organization-wide goals, and a better prepared, better trained, diverse workforce.

Description of Problem: Distance learning provides FAA with state-of-the-art quality course delivery to geographically dispersed students with a reduced dependency on travel to centralized facilities. Within this overall effort, this project focuses primarily on computer-based instruction (CBI) and web delivery as critical distance learning solutions. The emphasis for FY 2010 is replacing unsupportable platforms to continue this system's high reliability for all of FAA, facilitating courseware compatibility, and maximizing training and operational efficiency. Resident-based training is costly in per diem and travel expenses. The FAA requires cost-effective distance learning alternatives to reduce the current resident-based training load, to accommodate increases in training due to the introduction of new national airspace systems, continue personnel transition/refresher training, support succession training, and provide performance support.

Description of Solution: For FY 2010, $1,500,000 is requested to continue the agency's training efforts. Distance learning will use the existing CBI system and web delivery, coupled with the Aviation Training Network (ATN) satellite network, to provide a cost-effective distance learning delivery system and give the FAA a balanced and blended approach to delivering training to FAA employees. The requested funding will replace obsolete/unsupportable CBI platforms.

Benefits: The major benefit of distance learning is the substantial reduction in student travel and per diem costs associated with resident-based training. In addition, distance learning delivery methods increase training effectiveness as well as increase training opportunities for all FAA employees, provide flexibility in training schedules through local management control, and decrease the time employees spend away from their work site. The FAA CBI system is required to deliver initial operator, transition and maintenance training for many NAS Programs. Millions of dollars are saved by using this standard system instead of purchasing custom simulators for each program. The FAA CBI system is used to deliver nearly 50 percent of technical training resulting in a savings of over $10,000,000 per year.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	51,660.1 [1]
FY 2009 Appropriated	---	1,500.0
FY 2010 Request	---	1,500.0
FY 2011-2014	---	4,000.0
Total	Various	$58,660.1

[1] Includes reduction pursuant to P.L. 108-7, February 20, 2003.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations	Estimated Cost ($000)
1. CBI Hardware Replacement	---	$1,300.0
2. CBI Compatibility Testing and Design	---	100.0
3. Software Development	---	50.0
4. Network Upgrades	---	50.0
Total	Various	$1,500.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
3B03	**National Airspace System (NAS) Training Equipment Modernization- NAS Training Simulators**	**$6,700,000**	**Various**	**M-20**

FAA Strategic Goals: Organizational Excellence -– Ensure the success of the FAA's mission through stronger leadership, a better trained and safer workforce, enhanced cost-control measures, and improved decision-making based on reliable data. Objective 1 – Implement human resource management practices to attract and retain a highly skilled, diverse workforce and provide employees a safe, positive work environment. Make the organization more effective with stronger leadership, increased commitment of individual workers to fulfill organization-wide goals, and a better prepared, better trained, safer, diverse workforce

Description of Problem: Over the next 10 years, 73 percent of the agency's nearly 15,000 controllers will become eligible to retire. The agency plans to hire 12,500 controllers over the next 10 years in order to have enough recruits in the pipeline to meet backfill needs. Controller training consists of three major components that include screening, initial qualification training, and certification training. Screening is done using a computer based exam designed to measure the aptitude required to become a successful air traffic controller. Initial Qualification Training is generally conducted at FAA Academy, and provides students with the skills necessary to begin training at their assigned facility. Certification training is conducted at the facility and consists of a combination of classroom, simulation, and on-the-job training (OJT). The final result at the end of this training is for a candidate to achieve full certification on all positions, or Certified Professional Controller (CPC). With the expected magnitude of increased controller hires over the next 10 years, there are shortfalls in the simulation capabilities at terminal facilities that would negatively impact the agency's ability to successfully keep adequate CPCs at our major facilities. Although some simulation infrastructure currently exists at major Air Route Traffic Control Centers (ARTCCs) and Terminal Radar Approach Controls (TRACONs), these capabilities are outdated, and cannot meet the expected demands of the future for the increase expected each year for new controllers within the Certification phase of training. For air traffic control towers (ATCTs), there are no simulation capabilities at operational facilities.

Description of Solution: The FAA is a high technology agency that is reliant on a well-trained workforce, and its emphasis on the traveling public's safety is paramount. During the next 10-year hiring period, the agency must maintain an adequate number of CPCs, and controller candidates in the training queue for both qualification training at the Academy and for Certification training at operational facilities. The Training Simulation program will provide simulation capabilities to be deployed at terminal operational facilities in the NAS. The FAA's plan for training simulation includes procurement of ATCT, TRACON, and simulation capabilities to achieve increased levels of controllers getting to CPC status quicker than ever before, with a well trained focus on safety initiatives such as preventing operational errors and reducing runway incursions. While meeting the increased demands of controller training over the next 10 years are the primary objective, the agency intends to meet these demands in a more cost efficient, effective way through the Training simulation program.

In FY 2009, $20,000,000 was appropriated for the NAS Training Simulators. The program equipped selected terminal facilities with specialized simulation training equipment to further reduce the time it takes to check out transfers, re-certifications, refreshers and new hires to certified professional controller status.

For FY 2010, $6,700,000 is requested to continue supporting additional simulation capabilities for Tower Cabs.

Benefits: Air traffic control students will be trained in a safer, simulated, interactive environment, rather than in a live traffic situation, reducing risk to the flying public. This approach ensures training objectives are more fully met before students transition to live traffic in the control tower or en route center. A post implementation review of the ATCT simulation systems will be conducted and assessed for benefits in terms of how effective the systems are in meeting training requirements and how much OJT can be reduced. Once the review is complete, FAA anticipates that simulation will have its own significant set of stand-alone benefits.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	25	$35,018.0
FY 2009 Appropriated	12	20,000.0
FY 2010 Request	---	6,700.0
FY 2011-2014	---	0.0
Total	37	$61,718.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

	Locations	Estimated Cost ($000)
NAS Training Simulators – NAS (Field Sites)	---	$6,700.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
4A01	**System Engineering and Development Support**	**$31,700,000**	**Various**	**M-03, M-08, M-45**

FAA Strategic Goals: Organizational Excellence -– Ensure the success of the FAA's mission through stronger leadership, a better trained and safer workforce, enhanced cost-control measures, and improved decision making based on reliable date. Objective 3 - Improve financial management while delivering quality customer service.

Description of Problem: System Engineering and Technical Assistance (SETA) provides the continuity workforce required to support the agency goals of improving aviation safety and security, improving the efficiency of the air traffic control system, increasing the capacity and improving the reliability of the National Airspace System (NAS), and increasing productivity while reducing operating costs.

The Capital Investment Plan (CIP) specifies the need for a total system approach to modernizing the NAS. This effort will accommodate future demands and technology, improve vital safety services, and increase productivity, while reducing operating costs. The NAS architecture is the structure that reflects the changes in requirements and the evolution of technology in aviation. It is a road map for transition from one program to another, the replacement of existing infrastructure, the introduction of new capabilities, and the retirement of outdated systems. The key to the architecture's success and the future of NAS is maintenance of the interfaces between outgoing systems, current systems, and incoming systems. This is achieved through the discipline of system engineering and integration.

1. CIP Systems Engineering and Technical Assistance - SETA and Other Contractors ($28,700,000):

Description of Solution: For FY 2010, $28,700,000 is requested to support 174 contractor staff years to procure the necessary critical technical expertise to provide for various contracts supporting SETA, system architecture and other 8A support, and program evaluation support. The request will support air traffic control specialists, subject matter experts, computer science, electrical, and communications engineers, program analysts, cost analysts, financial analysts, operations research analysts, planners, and computer hardware and software technicians. This expertise meets the requirements of system engineering and integration for automation, communications, navigation and landing, surveillance, weather, software integration, and facilities for the NAS.

Benefits: SETA provides the continuity, innovation, and cost-effective workforce required to support agency goals of improving aviation safety and security, improving the efficiency of the air traffic control system, increasing the capacity and improving the reliability of the NAS, and increasing productivity while reducing operating costs. The creativity and innovation of the SETA workforce has resulted in significant cost savings and reductions of risk to FAA programs. SETA has also developed and enhanced software tools and programs to help improve the efficiency of the agency.

2. Continued General Support - Provide ANF/ATC Support (Quick Response) - ($3,000,000):

Description of Solution: Air navigation facility air traffic control systems support is requesting $3,000,000 which provides for engineering and related services to adjust to unforeseen circumstances affecting the safety and operations of the air traffic control system, as well as responding to specific emergency project deficiencies that would delay the realization of aviation user benefits.

Benefits: SETA provides the continuity, innovation, and cost-effective workforce required to support agency goals of improving aviation safety and security, improving the efficiency of the air traffic control system, increasing the capacity and improving the reliability of the NAS, and increasing productivity while reducing operating costs. The creativity and innovation of the SETA workforce has resulted in significant cost savings and reductions of risk to FAA programs. SETA has also developed and enhanced software tools and programs to help improve the efficiency of the agency.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$1,233,974.5 [1]
FY 2009 Appropriated	---	31,000.0
FY 2010 Request	---	31,700.0
FY 2011-2014	---	132,800.0
Total	Various	$1,429,474.5

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. System Engineering Technical Assistance Prime Contractor and Support Contractor and Services	---	$26,000.0
2. System Architecture/Other 8A Support	---	1,100.0
3. Program Evaluation	---	500.0
4. Computer Services	---	1,100.0
5. ATC/ANF Systems Support	---	3,000.0
Total	Various	$31,700.0

[1] Includes $248,000 reduction as part of the $1,500,000 Support Contract general reduction enacted in FY 1999. Includes $3,200 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
4A02	**Program Support Leases**	**$37,500,000**	**Various**	**M-08**

FAA Strategic Goals: Organizational Excellence - Ensure the success of the FAA's mission through stronger leadership, a better trained and safer workforce, enhanced cost-control measures, and improved decision-making based on reliable data. Objective 3 - Improve financial management while delivering quality customer service.

Description of Problem: To operate the NAS, FAA requires real property rights for approximately 3,145 rentable real estate leases. Without these leases FAA could not operate the NAS since a majority of its facilities reside either on leased land or in leased building space. The FAA must also obtain clear zones to prevent interference with electronic signals at certain facilities, such as very high frequency omnidirectional ranges, airport surveillance radars, and air route surveillance radars.

The real property leases are legally binding contracts and require rents to be paid each year. The total rent for the leases portfolio increases each year due to the addition of leases for new facilities and the renegotiation of expired leases.

Description of Solution: This program secures the required real property rights by providing the payments for approximately 2,398 land leases, 672 space leases, and 75 leases covering both land and space for operational facilities. It also funds the purchase of land when economically advantageous to FAA.

For FY 2010, $37,500,000 is requested to fund 3,145 leases along with other real estate requirements and will include:

- Payment of rents on approximately 3,145 land and space leases that directly support navigation, communication, weather, and air traffic control facilities;
- Costs associated with the rental and management of land and space for service/maintenance centers, deployment/development centers, laboratories, test beds, and other types of facilities that support the deployment and operation of technical facilities;
- Payments for condemnation of real property interests
- Funds for conversion of existing leases to fee ownership or perpetual easements
- Costs for real estate appraisals, market surveys, title reports, and other costs associated with the acquisition and management of real property assets;
- Funds for costs to relocate offices, facilities, personnel, and equipment and to combine or consolidate multiple offices when technically feasible and economically advantageous to the FAA;
- Funds for the development, establishment, management, administration, and maintenance of a database of leases and owned facilities, for developing business tools to enhance logistics activities, and for implementing program efficiency practices;
- Funding for certain costs associated with real property and equipment disposals with sale proceeds to be used to offset other direct and related program costs and funding for real property and equipment disposal activities;
- Funding for certain testing and analysis costs (environmental, suitability, sustainability, cost-effectiveness, etc.) in connection with the leasing, purchasing, usage, management, and disposal of land and space;
- Funding for costs associated with the termination of ATO leases or the re-use of vacated Automated Flight Service Station (AFSS) space for other ATO purposes; and
- Funding for real property costs associated with the transition to next generation facilities.

Benefits: This program improves management of the FAA's real property assets and supports the Agency Flight Plan Goal of Organizational Excellence through the improvement of financial management while delivering quality customer service**.** Real property costs are being effectively controlled through:

- The oversight and approval of all requests for additional real property rights,
- The oversight and approval of all major maintenance and enhancements to existing real estate, and

- The co-location of sites that currently are leased separately; hence, eliminating rents, utility costs, and maintenance costs for the excess space.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$481,270.1
FY 2009 Appropriated	---	43,504.5
FY 2010 Request	---	37,500.0
FY 2011-2014	---	161,300.0 [1]
Total	Various	$723,574.6

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Operational Leases	Various	$37,500.0

[1] Future requirements will be based on activity levels and local situations that are validated on a year-to-year basis.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
4A03	**Logistics Support Services (LSS)**	**$11,000,000**	**Various**	**M-05**

Flight Plan Goal #4 – Organizational Excellence

Objective #2 – Control cost while delivering quality customer service.

Description of Problem: The FAA has a serious shortage of government logistics personnel at regions and centers to manage real estate, acquisitions, and material for NAS modernization and capitalizing agency assets as required by the agency's Flight Plan. Without adequate logistics services, real estate will not be acquired, contracts to buy or upgrade equipment and construct facilities will not be awarded, and modernized equipment and systems will not be efficiently installed and commissioned. Additionally, FAA will not be able to adequately document the capital cost of FAA facilities or comply with mandatory accounting standards set by the Government Accountability Office (GAO) which could put the achievement of a clean audit opinion at risk.

Description of Solution: For FY 2010, $11,000,000 is requested to fund contractor-supplied logistics services. Through the LSS program, the agency utilizes contractor-supplied services to perform real property acquisition, materiel management, and contracting activities in support of FAA Capital Investment Plan (CIP) projects, and to conduct capitalization and property control-related activities. These services currently provide a significant portion of the workforce for acquisition, real estate, and materiel management at regions and centers. The LSS program is instrumental in establishing new or upgraded facilities, including air traffic control towers and TRACONs, throughout NAS. The logistics personnel services will support the FAA Facility Security Risk Management (FSRM) program. The LSS resources will continue to be used for asset tracking and documentation efforts to obtain and maintain a clean audit opinion.

Benefits: The LSS program supports the FAA's performance goals of organizational excellence by fielding modernized equipment, systems, and facilities within the timeframes established by the programs included in the CIP. The logistics services are used to achieve a clean audit report in compliance with GAO standards. The performance goal of safety is addressed in FAA contracts in support of the FSRM program, which is designed to improve physical protection of employees and facilities in critical infrastructure as required by Presidential Decision Directive 63, "Protecting America's Critical Infrastructure."

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	143,874.1 [1]
FY 2009 Appropriated	---	7,900.0
FY 2010 Request	---	11,000.0
FY 2011-2014	---	34,000.0
Total	Various	$196,774.1

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Real Estate Acquisition, Materiel Management, Contract Administration	Various	$11,000.0

[1] Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
4A04	**Mike Monroney Aeronautical Center Leases (MMAC)**	**$16,200,000**	**1**	**F-19**

Flight Plan Goal #2 – Greater Capacity

Objective #1– Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The MMAC lease provides all the land and 80 percent of the facility space comprising the Aeronautical Center, including maintenance of leased building exteriors and replacement of leased building systems. The average age of leased buildings at the Center is 42 years. Delayed repair and replacement of building systems lead to structural and environmental system risk.

The Aeronautical Center lease provides critical facilities to support the missions of air traffic training, aviation research, engineering support of NAS equipment, NAS supply chain operations, aviation medical research, and other important aviation regulation, registration, certification, safety, and business services in Oklahoma City. The lease reduces FAA annual operating costs by providing facilities that are cost effective and lower in cost than Oklahoma City GSA lease prices and national averages, FAA Headquarters, and other FAA facility locations.

The lease is for 1,100 acres of land, 2.8 million square feet of facility space comprised of:

- Master Lease – Land, base rent, maintenance, and insurance
- Airmen and Aircraft Registry Lease – Land, base rent, maintenance, and insurance
- Thomas Road warehouse lease
- Tower space for Terminal Doppler Weather Radar target generators
- Grounds Maintenance

The Center requires large parcels of land as NAS test sites for surveillance radar, communications, weather, and navigation/landing systems, as well as warehouse, administrative office space, and training facilities that support the missions of 5,500 employees and contractors, and 30,000 students annually. The Aeronautical Center is a Level IV security site based on numbers of employees, facility square footage, sensitivity of records, volume of public contact, and mission-critical facilities whose loss, damage, or destruction may have serious or catastrophic impact on the NAS. Funding for this program provides for the FY 2010 lease costs that are specified in the lease agreement and a contractual obligation through FY 2012, with automatic renewal without increase in base rent through 2028.

Description of Solution: For FY 2010, $16,200,000 is requested for the Aeronautical Center leases.

Benefits: Leasing Aeronautical Center facilities provides for support of critical infrastructure that includes:

- Aviation training for over 30,000 FAA and international students per year in resident and distance learning, including approx 1,000,000 hours of distance learning delivered annually
- Logistics services and supply support to the operational NAS to all FAA Airway Facility locations, Air Traffic, and approximately 70 DoD and international organizations
- Engineering services for NAS systems modification and repair
- Aviation research: medical and human factors for aviation personnel
- Standards and flight inspection services
- Regulation certification of safety related positions and equipment, airmen and aircraft records/registration
- Business services including cost accounting and payroll for the FAA and other DOT organizations

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	268,698.9 [1]
FY 2009 Appropriated		15,800.0
FY 2010 Request		16,200.0
FY 2011-2014	--	69,000.0
Total	1	$369,698.9

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Aeronautical Center Lease Payments	1	$16,200.0

[1] Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
4A05	**Transition Engineering Support**	**$15,000,000**	**Various**	**M-22**

FAA Strategic Goals: Organizational Excellence -– Ensure the success of the FAA's mission through stronger leadership, a better trained and safer workforce, enhanced cost-control measures, and improved decision-making based on reliable data. Objective 3 - Improve financial management while delivering quality customer service.

Description of Problem: Due to staffing shortfalls, FAA's technical workforce cannot handle the surge in demand for short-term programs/projects that are critical to managing the volume of diverse systems and equipment associated with National Airspace System (NAS) modernization. As a result, FAA will experience significant NAS modernization scheduling delays if additional support services are not available to complete these projects.

Description of Solution: The Transition Engineering Services program provides FAA with the technical expertise necessary to ensure that NAS modernization stays on schedule.

For FY 2010, $15,000,000 is requested for Transition Engineering Services to support the modernization schedules for NAS programs by providing a cost effective contractual vehicle for meeting critical Capital Investment Plan (CIP) projects and FAA organizational technical requirements. These resources will be used to:

- Meet the minimum contractual obligations as stipulated in the Transition Engineering Services (NISC) contract
- Maintain program stability so that FAA modernization projects remain on schedule, and
- Meet FAA and NISC program goals in accordance with the FAA Flight Plan and other internal agency plan

Benefits: The Transition Engineering Services program maps to organizational excellence by providing a highly skilled and experienced workforce at cost effective rates. This support integrates equipment and systems into the NAS and ensures that the equipment functions properly once delivered. It improves facility reliability and availability to the NAS, which results in safe, efficient, and cost effective air traffic services.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$559,799.9 [1]
FY 2009 Appropriated	---	10,700.0
FY 2010 Request	---	15,000.0
FY 2011-2014	---	60,000.0
Total	Various	$645,499.9

[1] Includes $358,000 reduction as part of the $1,500,000 Support Contract general reduction enacted in FY 1999. Includes $5,000,000 reduction of FY 2002 funds pursuant to supplemental P.L. 107-206, January 23, 2002. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Centrally Procured Services	---	$15,000.0

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
4A06	**Frequency and Spectrum Engineering – NAS Interference, Detection, Location, and Mitigation (IDLM)**	**$3,600,000**	**Various**	**M-08, M-43**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: Radio Frequency Interference (RFI) detrimentally affects ground and satellite-based NAS communication, navigation, and surveillance (CNS) services. RFI causes loss and corruption of fundamental voice and/or data information required for the safe air traffic control of aircraft. Since 1995, the FAA has experienced an average of 1,600 RFI events per year. The FAA existing legacy systems to resolve and restore RFI disrupted NAS services have reached their service life. Technology and equipment refresh is required to continue mitigating and resolving the disruptions to critical communication, navigation, and surveillance services throughout the NAS.

Description of Solution: The FAA will procure new RFI detection and location equipment to replace existing legacy systems and will procure and install new fixed monitoring systems around critical OEP airports.

For FY 2010, $3,000,000 is requested for the Interference, Detection, Location, and Mitigation (IDLM) program. The IDLM program will:

- Refresh existing fixed direction finding sites geo-location technology hardware and software around three OEP airports to increase accuracy and quick mitigation response including GPS signal-in-space interference resolution.
- Replace 19 Navigational Aids Signal Evaluator Radio Frequency Interference (NASE/RFI) airborne analog direction-finding systems with the Airborne Interference Monitoring Detection System~~s~~ (AIMDS) platform technology.

Also, $600,000 is requested for on-going in-service engineering activities to support all prototyping efforts.

Benefits: The Frequency and Spectrum Engineering Services Program maps to the FAA goals of Greater Capacity. Investing $3,600,000 in FY 2010, FAA will improve existing CNS service availability by reducing the restore time for RFI events. By implementing the IDLM program, NAS RFI events will be quickly detected, located, and resolved around critical airports, maximize the use of personnel resources for maintaining the primary undisrupted CNS service delivery, minimize deployment of costly flight inspection airborne missions, and will prevent operational aircraft delays caused by RFI. Also, IDLM is critical for enabling the benefits of Satellite based navigation and Global Positioning System (GPS) approaches.

Legacy direction finding systems operated only with analog radio signals. The technical refresh equipment will have the capability to detect and locate analog, digital and GPS radio signals. This technology refresh and expansion in capability will support the NextGen requirements. In-service engineering allows for immediate response to emerging technology solutions.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$8,400.0 [1]
FY 2009 Appropriated	---	3,500.0
FY 2010 Request	---	3,600.0
FY 2011-2014		2,000.0
Total	Various	$17,500.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Refresh Hardware/Software at three OEP Airports	---	$1,500.0
2. Replace 19 Navigational Aids Signal Evaluator Radio Frequency	19	1,500.0
3. In-Service Engineering	---	600.0
Total	Various	$3,600.0

[1] Prior year funding in the amount of $48,581.2 was appropriated under CIP #M15.01/02 (NAS Spectrum Engineering Sustained Support/Frequency Interference Support-Resolution.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
4A07	**Technical Support Services Contract (TSSC)**	**$22,000,000**	**Various**	**M-02**

FAA Strategic Goals: Organizational Excellence -– Ensure the success of the FAA's mission through stronger leadership, a better trained and safer workforce, enhanced cost-control measures, and improved decision-making based on reliable data. Objective 3 - Improve financial management while delivering quality customer service.

Description of Problem: The amount of skilled work necessary to modernize the National Airspace System (NAS) far exceeds available in-house resources.

Description of Solution: The Technical Support Services Contract (TSSC) is the agency's primary vehicle to provide a supplemental work force to install equipment and to support infrastructure modernization in a timely, cost-effective manner. Significant work is required to install, modify, and relocate equipment by personnel with electronic, mechanical, and civil engineering skills. Often, the engineering and technician support is of short duration and requires skills that FAA government employee work force does not have or exists in insufficient numbers for a specific type of installation need. TSSC allows FAA to avoid hiring added employees for a limited duration to handle surge demand such as when new equipment is installed at multiple locations.

For FY 2010, $22,000,000 is requested to continue the TSSC vehicle infrastructure costs.

Benefits: The TSSC program maps to Organizational Excellence by providing a highly skilled and experienced workforce at cost effective rates. In a typical year, the TSSC vehicle is used to purchase more than $60.5 million in labor and accomplish more than $27.8 million in non-labor cost activities such as site preparation and other public works construction. TSSC directly supports modernization to the NAS that ensures operational availability by replacing old equipment and sustaining the infrastructure.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$879,431.8 [1]
FY 2009 Appropriated	---	22,000.0
FY 2010 Request		22,000.0
FY 2011-2014	---	99,000.0 [2]
Total	Various	$1,022,431.8

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Contractor Labor and Travel (CL&T)	Various	$22,000.0

[1] Includes $407,000 reduction as part of the $1,500,000 Support Contract general reduction enacted in FY 1999. Includes reduction for EAS in FY 2002. Includes reduction pursuant to P.L. 108-7, February 20, 2003. Includes reduction pursuant to P.L. 108-199, January 23, 2004.

[2] Future requirements will be based on activity levels and local situations that are validated on a year-to-year basis.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
4A08	**Resource Tracking Program (RTP)**	**$4,000,000**	**Various**	**M-08**

FAA Strategic Goals: Organizational Excellence -– Ensure the success of the FAA's mission through stronger leadership, a better trained and safer workforce, enhanced cost-control measures, and improved decision-making based on reliable data. Objective 4 - Make decisions based on reliable data to improve our overall performance and customer satisfaction.

Description of Problem: The hardware and software for the Resource Tracking Program (RTP), which is the key tool that makes up the Corporate Work Plan (CWP) Toolset, must be constantly maintained and upgraded, to support FAA and the processes that will be impacted as it continues to evolve into ATO. If this program is not funded at the requested level RTP will fall out of sync with other systems and processes and the agency will not be able to retrieve reliable data for ATO Capital projects. RTP is used to track all ATO Capital projects from cradle to grave. It is also used to develop the CWP and work releases for the Technical Support Services Contract (TSSC). It interfaces with DELPHI and the Budget Execution Module (BXM). RTP is a centralized system with load-balanced servers residing in Headquarters.

Description of Solution: In order to keep RTP current, the software and hardware will continue to be modified to support the changing processes and the other systems such as the CWP Toolset with which RTP interfaces. To do this, the NAS Implementation Support Contract (NISC) and the Technical Support Services Contract (TSSC) will be maintained for contractor support, software development efforts, and technical support. Also, hardware and software licenses will be maintained to keep the cost of upgrades to a minimum. This maintenance will cover both the Headquarters and Boston sites. Documentation that is used to provide training to users and administrators of the system will also be maintained.

For FY 2010, $4,000,000 is requested to keep hardware and software licenses current, support Earned Value Management (EVM) and cost accounting, maintain TSSC contract and NISC support, upgrade training documentation, and continue to provide training to users and data administrators.

Benefits: The RTP meets the FAA performance goal of Improving Efficiency of Mission Support. Three of the primary achievements will be:

- Providing reliable data with an automated tracking and reporting system for capital projects that will enable decision-makers to enhance the use of agency resources;
- Keeping major acquisition programs on schedule and within costs by maximizing limited resources linked to budget information and processes. These achievements will be reached by providing enhanced program and project management capabilities with cost accounting of capital expenses to FAA. Managers and engineers will have up-to-date reliable data on capital projects through RTP;
- Improving productivity by more than 20 percent when a standardized project management process is supported and emulates current operating procedures; and
- Providing Earned Value Management capability.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$20,380.2 [1]
FY 2009 Appropriated	---	4,000.0
FY 2010 Request	---	4,000.0
FY 2011-2014	---	12,000.0
Total	Various	$40,380.2

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. Programming Planning/Management	---	$2,200.0
2. System Security	---	200.0
3. Hardware/Software Design and Development	---	1,500.0
4. Training	---	100.0
Total	Various	$4,000.0

[1] Prior to FY 1997, RTP was funded under the Technical Services Support Contract budget line item 4A10. Includes $3,600 reduction of FY 1998 funds pursuant to rescission contained in P.L. 106-69, October 9, 1999. Includes reduction pursuant ton P.L. 108-7, February 20, 2003.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
4A09	**Center for Advanced Aviation System Development (CAASD)**	**$79,000,000**	**Various**	**M-03**

FAA Strategic Goals: Greater Capacity -– Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 2 - Increase reliability and on-time performance of scheduled carriers.

Description of Problem: The FAA, along with its aviation partners, faces a broad range of technically complex challenges to achieve the Next Generation Air Transportation System (NextGen). Although FAA employees are highly knowledgeable about those technologies, it would be impossible to employ all of the research, science and engineering expertise needed to develop and improve them. The FAA requires highly specialized simulation and computer modeling capabilities that it does not have in-house and are only available through a Federally Funded Research and Development Center (FFRDC) that has unique knowledge, skills, and capabilities in aviation research, systems engineering and analysis. The establishment of a stable source of funding, along with a long-term contractual relationship, is in the best interest of the public and the FAA, because it permits economies that can only be supported with an established work force and provides continuity of services for an efficient and effective use of an experienced professional staff.

Description of Solution: The Center for Advanced Aviation System Development (CAASD) is a Federally Funded Research and Development Center (FFRDC), operating under a Memorandum of Agreement with the MITRE Corporation. CAASD has unique knowledge, skills, and capabilities in aviation research, systems engineering, and analysis. CAASD also conducts a continuing program of research, development, system architecture, and high-level system engineering to meet FAA's long-term NAS requirements. A long-term contractual relationship is in the best interest of the public and FAA, because it stabilizes funding and supports an established and experienced work force that provides continuity of services. In addition, CAASD's charter permits access to sensitive and confidential agency information and data that is not normally available to support contractors. CAASD's expertise is critical to FAA in transforming the nation's air transportation system in an effective and timely manner.

The FY 2010 funding will support approximately 275 MITRE Technical Staff years (MTS) of research and systems engineering as well as technical and operational analyses. This staffing level is well below the Congressional ceiling of 600 MTS. The FFRDC Executive Board has approved the third edition of the FFRDC Long Range Plan (FYs 2008 – 2012).

For FY 2010, $79,000,000 is requested to continue research and development, advanced analysis, and engineering in the following areas.

NAS and NextGen Systems Integration and Evolution. Develop and integrate the NextGen enterprise architecture, operational concepts, capability action plans, and roadmaps to achieve an integrated evolution and align agencies' enterprise architectures; analyze NAS-wide strategic issues involving multiple outcomes for efficient investment and operational decisions; provide definition, structure, and content for the NAS Enterprise Architecture and ensure alignment with the evolving NextGen architecture; provide recommendations for U.S. and international flight data processing to improve NAS operations and global harmonization; assess and provide recommendations for NAS evolution paths to maximize the use of common capabilities and automation platforms that will support investment decision making; validate the productivity gains, operational feasibility and user benefits of selected NAS initiatives to effect the transition to NextGen; assess service and cost benefits and provide recommendations for implementing net-centric strategies that reduce NAS complexity and improve user access to information.

Communications Modernization. Conduct technical analyses on architecture alternatives at the program, service, and domain levels to ascertain which alternatives meet the required level of NAS communications service at least cost; conduct engineering analysis, network definition, and transition strategy studies for the FAA's Voice Communications and SWIM programs to provide robust network-enabled operations and to reduce the overall FAA communications costs; conduct cost analyses on spectrum and radio technology issues applied to the problem of extending the existing air-ground voice communications systems. As options for life extension develop, CAASD will work with the FAA's NextGen plan and other CAAs around the world to develop the next generation system. This will enable the FAA to take a global leadership role in aviation communications; provide technical and operational insight into the implementation of digital and data communications services in the NAS. Ensure that FAA and the user community understand the operational benefits to be gained.

Performance Based NAS. Provide new concepts for achieving a performance-based NAS, for example, the RNP Parallel Approach Transition (RPAT) concept, which utilized CAASD's operational knowledge, laboratories, and visual tools in its development; conduct technical analyses to identify airports and runways that will benefit from RNP and RNAV procedures; develop algorithms and prototype performance case analyses to validate Flight Standards procedure development tools; identify problems that emerge in the implementation of RNP and RNAV procedures and recommend resolutions and new criteria requirements using CAASD's air traffic, airline, and avionics expertise; analyze and model all aspects of navigation assets, including Wide Area Augmentation System (WAAS), Local Area Augmentation System, (LAAS), divestiture of navigation aides, modernization of GPS, and interoperability with other Global Navigation Satellite System (GNSS) systems (e.g., Galileo).

En Route Evolution. Perform system engineering analyses for new technologies, capabilities, and procedures for the en route system architecture and operational applications; develop concept of operations and prototypes to demonstrate and evaluate new capabilities and procedures; conduct risk management analyses to identify and mitigate the key risks for capability completion; conduct benefit and cost analyses for new capabilities; assess and prioritize candidate en route extensible capabilities; develop system-level requirements for capabilities that can be transferred to the development contractor; validate innovative approaches that can reduce the time and cost of training controllers; develop and conduct field evaluations of a simulation training prototype that will provide effective transition of automation and procedural advancements into operation use; validate the operational feasibility and expected productivity gains from changing roles and responsibilities in the en route domain.

Terminal Operations and Evolution. Provide FAA with technical analyses that inform decision making on which technical architecture alternatives provide the required level of service and minimize costs; provide technical and operational insight into systems that can be used to safely permit reduced separation standards and/or significantly increase overall system capacity and productivity, including factors such as system technical performance, weather measurement performance, human factors engineering, operational evaluation, safety assessment, and decision support system design; provide operational feasibility and implementation risk analyses that assist the FAA in identifying and prioritizing among the more promising operational changes, procedures and enabling technologies; provide technical and operational expertise to enhance the quality and efficiency TRACON controller training, to allow for reduced training time and cost, improve trainee success rates, and improved workforce capabilities (e.g., reduced operational errors, improved productivity).

Airspace Design and Analysis. Structure and execute technical analyses that will inform FAA and Industry decisions on airspace design and management; engineer the processes that govern airspace strategic planning and analysis efforts; investigate, innovate, and develop modeling, simulation, and analysis capabilities facilitating airspace design; explore issues that influence strategic airspace management and design policy, such as sectorization concepts; integrate all the above efforts to provide a national, system-wide optimization of airspace, leveraging CAASD experience, and perspective to coordinate multi-regional and multi-facility design efforts and other national airspace activities.

NAS System Operations. Improve the NAS system-level performance by assessing system performance during severe weather and snowbird seasons; design, develop, and evaluate solutions to significant issues with FAA operational personnel and customers responsible for implementing the solutions; develop improved analytic techniques and capabilities for system operations analysis; develop operational strategies to manage emerging and chronic congestion problems by modeling capacity, delay, predictability, ripple effects, and access issues; design and evaluate solutions with FAA operational personnel and customers responsible for implementing the solutions; develop improved measurement techniques for assessing operations; improve the FAA's responsiveness to customer issues and improve traffic management strategies by modeling and assessing major operational problems with integrated analysis to verify alternate solutions; develop new modeling and analysis capabilities for analytic weaknesses; design, model, and assess new system operations procedures for new capabilities and airspace changes that will be implemented in the near future; develop analysis techniques and data to improve information on en route and terminal operations used in FAA operational and investment decision making; develop and evaluate new metrics to measure overall NAS operational performance.

Traffic Flow Management (TFM) Operational Evolution. Provide analysis of the TFM requirements and system design in order to ensure that developed system enhancements will meet the current and future operational needs in a cost-effective manner; develop metrics that provide insight into the performance of the TFM domain; provide assessment of concept maturity, operational feasibility and implementation risks; advance the maturity of concepts to account for uncertainty (e.g. probabilistically) in predictions and decision making, by developing algorithms and prototype capabilities and conducting human-in-the loop (HITL) evaluation that will improve the FAA's ability to predict imbalances between traffic demand and real NAS capacity; translate concepts into requirements and assess the impact of enhancement capabilities on the TFM modernization system so that implementation cost and difficulty can be factored into the prioritization planning process for new capabilities and procedures.

Future NAS Performance and Analysis. Assess the NAS-wide operational impacts of investment options and decisions; improve understanding of the future environment, including anticipated demand at airports and for airspace; anticipate the impact of planned improvements on future airport and airspace capacity; perform analyses to assess the affordability and long-term economic implications of different investments, operational changes, or proposed policies.

Aviation Safety. Perform technical analyses of NAS-wide accident and runway incursion risk to identify airports or specific types of operations with the highest risk, and prioritize implementation of appropriate operational and technological mitigations, leading to a reduction in accidents and runway incursions; develop metrics and processes that allow FAA to proactively identify potential safety issues with both operations and architecture; identify risks before they lead to incidents or accidents; identify and assess the feasibility of new or advanced capabilities and standards that mitigate safety issues in the NAS.

Mission Oriented Investigation and Experimentation (MOIE). Develop the tools and techniques for studying system capacity, throughput, performance, system dynamics and adaptation to technology- and policy-driven change; identify opportunities for innovative solutions to NAS problems and enhancements to NAS capabilities and procedures, and capitalize on them through applied research and technology transfer; research future concepts and technologies to understand their potential impact on the NAS and to develop and refine concepts for operational use and potential benefits; use prototyping and in-lab demonstration and experimentation to learn what works and what doesn't, and incorporate stakeholder feedback and building industry consensus on the way forward in key areas; strengthen FFRDC systems engineering skills and tools by exploring new regimens including complexity theory, agent-based modeling, and productivity modeling; leverage collaborations with industry, academia, and the broader aviation research community.

NAS-Wide Information System Security. Provide technical guidance on the most effective way to engineer security capabilities into the NAS, emphasizing a NAS-wide approach that reduces overall cost by leveraging shared services and building security into the underlying IT infrastructure; provide guidance on security threats, technology, standards, and practices being applied in other government and commercial enterprises in order to evolve Information Systems Security (ISS) to adapt to changing threats and technology advances; develop requirements and recommend solutions for effective cyber incident management program; advise the FAA on creating an IT infrastructure that will be resilient, flexible, and adaptable, and provide a defense-in-depth strategy; apply MITRE experience with the DOD's successful transition to Network Centric Operations and CAASD's NAS domain knowledge to provide technical guidance on deploying network centric technologies within the NAS while maintaining ISS defense-in-depth.

Broadcast and Surveillance Services. Research ADS-B ground and cockpit-based solutions that will permit the FAA to deploy ADS-B throughout the entire NAS in a cost effective and timely manner, while reducing the cost of ownership for FAA surveillance infrastructure and ATC, and improving safety for all NAS users; prototype basic and advanced ADS-B applications that will result in improved efficiency and capacity for FAA and the airlines. This includes transforming applications that will leverage the aircraft as an active part of the NAS, as in the NextGen vision, and result in more efficient NAS operations; assess the impact of ADS-B on safety, capacity, and efficiency benefits for the FAA and users. This includes performing user coordination and lab simulations prior to deployment, and data collection and analysis after deployment; develop domestic and international requirements and engineering standards for future ADS-B applications, in close coordination with the users and manufacturers, as part of RTCA, the ICAO, FAA, RFG, and Eurocontrol standards development activities.

Special Studies, Laboratory and Data Enhancements. Manage the breadth of the CAASD FAA work program in a manner that ensures the activities contributing to each individual outcome benefit from the broader perspective of the entire work program; provide the CAASD work program with a research environment where prototypes and capabilities can be brought together with the appropriate mixture of fidelity and development flexibility to facilitate integration investigations, compressed spiraling of operational concepts and procedure development; exploration of new technologies, visualization of concepts, exploration of human factor issues, and transition of prototypes between the lab and the field; provide the CAASD work program with a an efficient aviation data repository system and associated tools to support data analysis that results in more useful products across the work program at a lower cost; provide the CAASD work program with a flexible model of the NAS capable of quickly and reliably estimating the high-level impacts of new technologies, procedures, or infrastructure improvements on key system performance metrics; conduct special studies of key subjects, as directed by FAA senior management.

Benefits: High quality research, systems engineering, and analytical capabilities help FAA meet the technically complex challenges in the NAS. CAASD provides independent advanced research and development required by the FAA to obtain technical analyses, prototypes and operational concepts needed to fulfill the vision for NAS architecture, FAA's Flight Plan, the Operational Evolution Partnership (OEP) – FAA's plan to NextGen - and the NextGen Integrated Plan. CAASD efforts support all Flight Plan goals across the board and the FFRDC continues to play a key role in defining NextGen. Its expertise is critical to FAA's efforts to transform the nation's air transportation system in an effective and timely manner.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	---	$1,086,866.1 [1]
FY 2009 Appropriated	---	78,000.0
FY 2010 Request	---	79,000.0
FY 2011-2014	---	327,100.0
Total	Various	$1,570,966.1

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
1. CAASD (Air Traffic Organization)	---	$64,500.0
2. CAASD (Non-Air Traffic Organization)	---	14,500.0
Total	Various	$79,000.0

[1] Prior year funding for GCNSS was appropriated in FY 2004 under OEP BLI 5A30.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
4A10	**Aeronautical Information Management Program**	**$10,000,000**	**Various**	**A-08**

FAA Strategic Goals: Increased Safety -– To achieve the lowest possible accident rate and constantly improve safety. Objective 1 - Reduce commercial air carrier fatalities.

Description of Problem: The safety of the National Airspace System (NAS) is predicated on common and coherent situational awareness among the operators and users of the system. The lack of timely and/or accurate aeronautical information (AI) such as Notices to Airmen (NOTAM) and pertinent military operations data, as well as the lack of internal and external mechanisms for delivering this information to the appropriate end users, has been shown repeatedly to be contributing factors in operational errors and runway incursions.

The problems currently associated with providing aeronautical information services relate to safety, operational constraints, system issues, and institutional issues.

Safety – Since AI is provided for the most part as paper products, it is often incomplete, inconsistent and inaccurate; it involves manual manipulation during processing and publication; and it is not provided from a single source in a timely manner. This can increase the risk of misinformation being disseminated and lead to accidents.

Aeronautical information customers/users use non-standard, product driven data from multiple sources; this causes aeronautical information overload. Managing aeronautical information relies on manual and stove-piped operations to collect, integrate, and distribute information. The paper-based products, such as airport facility directories and charts which provide a static view of the airspace system, must be integrated manually with more dynamic information, like NOTAMs, causing pilots and other customers to expend considerable effort parsing and integrating these multi-source, multi-formatted, data. Frequently the different sources contain the same or similar data, but these data are often inconsistent or inaccurate. Furthermore, dissemination may not be performed in a timely enough manner. Since the aeronautical information is not digital, using the paper-generated information in simulations or digital displays requires manual entry, a time consuming and error-prone process.

Operational Constraints - Legacy AI services are not providing information to meet the needs of modern electronic systems/devices and are not ameliorating the constraints within which the aviation community must function.

Aircraft are equipped for the 21st century with Global Positioning Systems (GPS), Electronic Flight Bag (EFB) systems, Automatic Dependent Surveillance (ADS) and many other technologies; meanwhile, aeronautical information is being promulgated as paper charts, publications and NOTAMs.

In the globally competitive aviation business, airlines are operating on thin financial margins and need to achieve efficiencies in a constrained, dynamic environment. The dissemination of real-time information on changing aeronautical conditions will allow airlines to perform forecasting simulations and adjust their use of the airspace system to the changed conditions. To increase overall system efficiency, mitigate capacity restrictions, facilitate delivery of real-time facility status information, eliminate hazards to flight, and reduce system outages, aeronautical information needs to be digitally encoded so it can be interpreted by computers.

System Issues **-** There are technical system-to-system delivery issues and difficulties due to aging equipment in our current aeronautical information environment.

There are too many manual interfaces. Use of manual processes may result in errors, promulgates duplicate data, and produces inefficiencies that may compromise safety. In addition, timely availability of aeronautical information suffers from deficiencies in integration with the military systems. For example, the Central Altitude Reservation Function (CARF) military system is obsolete, resulting in increased workload on personnel due to slow, manual labor-intensive efforts to enter necessary military-related information. Exchanging data between military systems such as CARF or Military Airspace Data Entry (MADE) and FAA systems can also entail a manual process.

Currently systems that create, process, store and, disseminate aeronautical information are out-of-date and reaching end-of-service life, thus leading to high operational and maintenance costs. Hardware technical refresh and new or improved alternatives for handling, processing and disseminating aeronautical information need to be developed.

Institutional Issues - Issues of regulations, procedures, global standards, and legal liability, cost recovery, intellectual property, and sovereignty could impede our ability to deliver the type of aeronautical information required for future systems. We need to address these issues so that they do not prevent our ability to change, once technical issues are dealt with.

Description of Solution: Aeronautical Information Management (AIM) Modernization is committed to improving the delivery of NAS status information including Notices to Airmen, Special Use Airspace status, weather information and flight planning services. The AIM Modernization will:

- Provide a modern information management system for NAS status information including NOTAM, SUA status, weather products and flight planning.
- Provide mission essential, secure support to the NAS operational environment.
- Improve the quality and consistency of aeronautical information by improving information integrity.
- Support current and future customer needs by providing information in computer readable formats.
- Ensure FAA aeronautical information systems are consistent with International Civil Aviation Organization (ICAO) standards and recommended practices.

To accomplish this mission, AIM Modernization has formulated a two segment solution development strategy:

- Segment 1 NOTAM Modernization: Provide the foundation for a modern AIM information management infrastructure, provide enhanced Notices to Airmen (NOTAM) services and make critical improvements to the FAA's Central Altitude Reservation Facility (CARF).
- Segment 2 Digital Integrated Briefing: Incrementally add aeronautical status information capability in the areas of special use airspace management, performance metrics, flight planning support and weather product support.

Products that were developed with the F&E funding provided in FY 2008 include:

- Completed Technical Refresh of AISR Workstations September 2008.
- Released new NOTAM Order effective January 2008. Order establishes new policy for processing Local NOTAMs as Distant NOTAMs.
- Improved FAA and DOD compliance with the MILOPS systems by increasing compliance 20 percent over 2007 levels.
- Complete initial requirements and design activities to support a Central Altitude Reservation Function (CARF) redesign September 2008.
- On track to complete Initial Investment Decision for AIM Modernization.
- Developed AIM enterprise architecture (EA) September 2008. Completed EA training and beginning to create EA
- Views of AIM systems.
- Dompleted installation and make services available to the public for 13 additional Alaska weather cameras September 2008.
- Aeronautical Information Exchange Model (AIXM) version 5.0 released March 10, 2008. Completed training for over 100 personnel. Additional training is scheduled.
- Pursuing plans to participate in an Open Geospatial Consortium (OGC) 2008-2009 Test Bed, in which information in AIXM form will be transmitted with other data to verify the interoperability of AIXM and OGC standards.

Based on the projected work plan, products that will be developed in FY 2009 include:

- Initiate development of NOTAM policy and systems to support International Civil Aeronautical Organization (ICAO) standards. Provide digital NOTAM capability to 10 airports

- Incorporate 100 percent of new NOTAM policy guidelines into NOTAM Entry Systems.
- Continue AISR Server Replacements.
- Accomplish Final Investment Decision and commence Solution Development for AIM Modernization - Segment 1.
- Integrate "AS IS" Aeronautical Information Management (AIM) enterprise architecture into the NAS enterprise architecture.
- Improve FAA / DOD compliance with Military Operations (MILOPS) systems.
- Ensure compliance of Special Use Airspace (SUA) notifications with NOTAM and Airspace policy.
- Continue to promote use of AIM data standards by development and delivery Aeronautical Information Exchange Model (AIXM) Release 5.1.

Based on the projected work plan, products that will be developed in FY 2010 include:

- Ensure 100 percent compliance of Special Use Airspace (SUA) notifications with NOTAM and Airspace policy.
- Begin ISO Certification process for all AIM Modernization operations associated with NOTAMS.
- Provide NOTAM origination access to all US airports.
- Continue Solution Development for AIM Modernization – Segment 1.
- Complete Investment Analysis Readiness Decision and Initial Investment Decision for AIM Modernization – Segment 2.
- Integrate "TO BE" AIM enterprise architecture into NAS Enterprise Architecture.
- Ensure 100 percent of new AIM projects are captured by Enterprise Architecture.
- Deliver Central Altitude Reservation Function (CARF) automation system.
- Begin ISO Certification process for all AIM Modernization operations associated with MILOPS.

Benefits: AIM Modernization benefits are being developed and quantified as part of the Initial Investment Decision. Major benefits for Segment 1 are anticipated to be:

1. Legacy operations and maintenance cost savings: The existing systems are at end of service life and using an out-modeled architecture. New architecture approaches using virtualization and consolidated servers will result in lower operation, maintenance and recovery costs.

2. Savings through labor cost reductions to perform CARF functionality: The CARF system is beyond end of life and additional command center staff is needed to manually compensate for legacy system deficiencies. The continued degradation of CARF automation utility will eventually result in three times the staff required to process altitude reservations manually.

3. Airline and AIS provider labor cost savings: Airlines and AIS providers have dedicated personal to process, interpret and investigate legacy text NOTAMS. Digital NOTAM will reduce confusion and increase the ability to directly integrate NOTAM information into pilot briefings. A survey of major airlines indicates a savings of 10 to 200 hours daily.

4. NOTAM related safety benefits: On average 4 accidents a year reference NOTAMs as a contributing factor. In addition, data from the pilot self-reporting database indicates that NOTAM issues contribute to many self-reported errors.

5. NOTAM operational issues: Better and more timely NOTAM information will enable pilots and airlines to improve flight scheduling and planning. We anticipate that these changes will reduce en route and taxiing time at airports. Discussions with major carriers like FedEx indicate that NOTAM confusion causes operational inefficiencies.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-2008)	311	$79,841.0
FY 2009 Appropriated	80	10,000.0
FY 2010 Request	---	10,000.0
FY 2011-2014	---	27,600.0 [1]
Total	391	$127,441.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Aeronautical Information Management	---	$10,000.0 [2]

[1] Future requirements are pending a JRC Decision.
[2] This budget request is divided between NOTAMs, NAIMES, and MILOPS. The narrative above clearly defines these three major parts of the program.

Budget Item:	Title:	Request:	Locations:	CIP Item(s):
5A01	**Personnel and Related Expenses**	**$470,000,000**	**Various**	**M-08, X-01**

(Dollars in Thousands)

	FY 2008 Enacted	FY 2009 Enacted	Change	FY 2010 Request
FTE, Direct	2,831	2,831	0	2,831
EOY Employment	3,181	3,181	0	3,181
Funding	$459,973	$460,500	+$9,500	$470,000

This activity funds the personnel, travel and related expenses of the FAA F&E workforce. The F&E workforce includes electronic, civil, and mechanical engineers; electronics technicians; quality control and contract specialists, and flight inspection personnel. The FY 2010 request for personnel related expenses is further justified as follows:

	FY 2008 Enacted	FY 2009 Enacted	Change	FY 2010 Request
Personnel Compensation and Benefits	$416,081	$415,718	+$9,295	$425,013
Travel	34,276	34,971	155	35,126
Other Objects	9,616	9,811	50	9,861
Total Funding	$459,973	$460,500	+$9,500	$470,000

Explanation of Changes: +$9,500

- +$3,253 Annualization of FY 2009 pay raise and locality pay
- +$5,229 FY 2010 pay raise and locality pay
- +$813 Annualization of performance pay increases
- + 205 Inflation

PERSONNEL COMPENSATION and BENEFITS (PC&B)

For FY 2010 the agency is requesting an increase of $9,295 to sustain the current Facilities and Equipment (F&E) workforce. This workforce is critical to the FAA's ability to modernize the NAS. Their work ensures that new systems enhancement, such as NextGen, contribute to the overall efficiency, safety, and reliability of the NAS. Civil, mechanical, and electrical engineers are required to provide technical support for design reviews, perform site preparation and installation, conduct technical evaluations, and provide systems integration and in-service management.

TRAVEL

An increase of $155 is requested for inflation in travel costs as well as additional required travel to accomplish training, installation and certification of new equipment funded in the Facilities and Equipment appropriation.

Travel requirements are driven by F&E engineering and technical work. Installation crews spend as much as 80 percent of their time working at sites distant from their assigned work place. The ability to use centrally located technicians and engineers ensures a consistent, highly proficient pool of personnel to accomplish these critical tasks. These engineers and technicians are involved in development and operational testing, factory acceptance testing, site evaluations, site preparation, critical design reviews, quality assurance activities, and support of field installation crews.

Similarly, Aviation Safety (AVS) specialists spend as much as 50 percent of their time at sites distant from their assigned workplace. Their support ensures that NAS modernization is accomplished consistent with worldwide aviation standards as well as work with other International Civil Aviation Organization member states.

OTHER OBJECTS

An increase of $50 is requested to maintain funding for other objects. Spending in other objects includes contractual services in support of facilities and equipment as well as supplies and common use equipment.

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RESEARCH, ENGINEERING, AND DEVELOPMENT

(AIRPORT AND AIRWAY TRUST FUND)

For necessary expenses, not otherwise provided for, for research, engineering, and development, as authorized under part A of subtitle VII of title 49, United States Code, including construction of experimental facilities and acquisition of necessary sites by lease or grant, $180,000,000, to be derived from the Airport and Airway Trust Fund and to remain available until September 30, 2012: *Provided*, That there may be credited to this appropriation as offsetting collections, funds received from States, counties, municipalities, other public authorities, and private sources, which shall be available for expenses incurred for research, engineering, and development.

PROGRAM AND FINANCING
($ in Millions)

Identification code: 69-8108-0-7-402		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Obligations by program activity			
	Direct program			
00.11	Improve aviation safety	94	110	91
00.12	Improve efficiency of the air traffic control system	29	47	49
00.13	Reduce environmental impact of aviation	15	34	35
00.14	Improve the efficiency of mission support	5	7	5
09.01	Reimbursable program	7	16	16
10.00	Total new obligations	150	214	196
	Budgetary resources available for obligation			
21.40	Unobligated balance carried forward, start of year	26	32	5
22.00	New budget authority (gross)	154	187	196
23.90	Total budgetary resources available for obligation	183	219	201
23.95	Total new obligations	-150	-214	-196
24.40	Unobligated balance carried forward, end of year	32	5	5
	New budget authority (gross), detail			
	Discretionary:			
40.26	Appropriation (trust fund) [20-8103-0-402-N-0505-01]	147	171	180
43.00	Appropriation (total discretionary)	147	171	180
	Spending authority from offsetting collections			
	Discretionary			
58.00	Offsetting collections (cash)	1	16	16
70.00	Total new budget authority (gross)	154	187	196
	Change in unobligated balances			
72.40	Obligated balance, start of year	123	137	170
73.10	Total new obligations	150	214	196
73.20	Total outlays (gross)	-120	-181	-204
73.40	Adjustments in expired accounts (net)	-7	.....	.....
74.10	Change in uncollected customer payments from Federal sources (expired)	-6	.....	.....
74.40	Obligated balance, end of year	137	170	162
	Outlays (gross), detail			
86.90	Outlays from new discretionary authority	67	91	95
86.93	Outlays from discretionary balances	53	90	109
87.00	Total outlays (gross)	120	181	204
	Offsets			
	Against gross budget authority and outlays			
88.00	Offsetting collections (cash) from: Federal sources	-1	-16	-16
	Net budget authority and outlays			
89.00	Budget authority	147	171	180
90.00	Outlays	119	165	188

This account provides funding to conduct research, engineering, and development to improve the national airspace system's capacity and safety, as well as the ability to meet environmental needs. For 2010, the proposed funding is allocated to the following performance goal areas of the FAA: increase safety and create greater capacity. The request includes funding for several research and development activities of the Next Generation Air Transportation System (NextGen), as well as the Joint Planning and Development Office which coordinates the interagency effort to develop NextGen.

OBJECT CLASSIFICATION
($ in Millions)

Identification code: 69-8108-0-7-402		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Direct obligations			
	Personnel compensation			
11.11	Full-time permanent	26	31	32
11.13	Other than full-time permanent	1	1	1
11.19	Total personnel compensation	27	32	33
11.21	Civilian personnel benefits	7	8	8
12.10	Travel and transportation of persons	2	3	3
12.55	Research and development contracts	86	123	108
12.60	Supplies and materials	1	2	2
13.10	Equipment	1	2	2
14.10	Grants, subsidies, and contributions	19	28	24
19.90	Subtotal, obligations, Direct obligations	143	198	180
	Reimbursable obligations:			
22.55	Research and development contracts	7	16	16
29.90	Subtotal, obligations, Reimbursable obligations	7	16	16
99.99	Total obligations	150	214	196

Employment Summary

Identification code: 69-8108-0-7-402		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Direct:			
10.01	Civilian full-time equivalent employment	263	303	308

EXHIBIT III-1

RESEARCH, ENGINEERING & DEVELOPMENT
Summary by Program Activity
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

	FY 2008 Actual	FY 2009 Estimate	FY 2010 REQUEST	CHANGE FY 2009-2010
Improve Aviation Safety	96,526	90,763	91,085	322
Improve Efficiency	30,234	43,226	48,543	5,317
Reduce Environmental Impacts	15,469	31,658	34,992	3,334
Mission Support	4,599	5,353	5,380	27
TOTAL	**146,828**	**171,000**	**180,000**	**9,000**
FTEs				
Direct Funded	263	303	308	5
Reimbursable, allocated, other	0	0	0	0

EXHIBIT III-2

RESEARCH, ENGINEERING & DEVELOPMENT
SUMMARY ANALYSIS OF CHANGE FROM FY 2009 TO FY 2010
Appropriations, Obligations, Limitations, and Exempt Obligations

Item	Change from FY 2009 to FY 2010	FY 2010 PC&B by Program	FY 2010 FTEs by Program	FY 2010 Contract Expenses	Total
FY 2009 Base		Note Columns are Non-Add			
Research, Engineering and Development Appropriations, Obligations, Limitations, and Exempt Obligations		**$43,215**	**303**	**$103,226**	**$ 171,000**
Adjustments to Base					
Annualization of FY 2009 Pay Raise	750	750	5		
FY 2010 Pay Raise	1,059	1,059			
WIGS	615	615			
Non-pay Inflation	85				
Subtotal, Adjustments to Base	**2,509**	**2,424**	**5**		**2,509**
New or Expanded Programs					
Improve Aviation Safety	1			1	
Improve Efficiency	3,650	600	5	3,050	
Reduce Environmental Impacts	2,827	150		2,677	
Mission Support	13			13	
Subtotal, New or Expanded Programs	**6,491**	**750**	**5**	**5,741**	**6,491**
Total FY 2010 Request	**9,000**	**45,639**	**308**	**108,967**	**180,000**

	Budget Line Item ($000)	FY 2008 Enacted	FY 2009 Estimate	FY 2010 Request
A11.	**Improve Aviation Safety**	**96,526**	**90,763**	**91,085**
	Commercial Aviation Safety			
a.	Fire Research and Safety	7,350	6,650	7,799
b.	Propulsion and Fuel Systems	4,086	3,669	3,105
c.	Advanced Materials/Structural Safety	7,083	2,920	2,448
d.	Atmospheric Hazards/Digital System Safety	3,574	4,838	4,482
e.	Aging Aircraft/Continued Airworthiness	15,946	14,589	10.944
f.	Aircraft Catastrophic Failure Prevention Research	2,202	436	1,545
g.	Flightdeck/Maintenance/System Integration Human Factors	9,200	7,465	7,128
h.	Aviation Safety Risk Analysis/System Safety Management	9,517	12,488	12,698
i.	Air Traffic Control/Technical Operations Human Factors	10,000	10,469	10,302
j.	Aeromedical Research	7,760	8,395	10,378
k.	Weather Program	16,888	16,968	16,789
l.	Unmanned Aircraft System Research	2,290	1,876	3,467
A12.	**Improve Efficiency**	**30,234**	**43,226**	**48,543**
a.	Joint Planning and Development Office	14,321	14,466	14,407
b.	Wake Turbulence	12,813	10,132	10,631
c.	GPS Civil Requirements	3,100	-	-
d.	NextGen – Air Ground Integration		2,554	5,688
e.	NextGen – Self Separation		8,025	8,247
f.	NextGen – Weather Technology in the Cockpit		8,049	9,570
A13.	**Reduce Environmental Impacts**	**15,469**	**31,658**	**34,992**
a.	Environment and Energy	15,469	15,608	15,522
b.	NextGen Environmental Research – Aircraft Technologies, Fuels, and Metrics	-	16,050	19,470
A14.	**Mission Support**	**4,599**	**5,353**	**5,380**
a.	System Planning and Resource Management	1,184	1,817	1,766
b.	William J. Hughes Technical Center Laboratory Facility	3,415	3,536	3,614
	R,E&D Total	**146,828**	**171,000**	**180,000**

Budget Item	Program Title	Request
A11.a.	Fire Research and Safety	$7,799,000

GOALS:
This program supports the following Flight Plan goal: Increased Safety.

Intended Outcomes: The Fire Research and Safety Program helps achieve FAA's strategic goal of increasing aviation safety by reducing the number of accidents associated with aircraft fires and by mitigating the effects of a post-crash ground fire. The program develops technologies, procedures, test methods, and fire performance criteria that can prevent accidents caused by hidden in-flight fires and fuel tank explosions and improve survivability during a post-crash fire. Fire safety research focuses on near-term improvements in fire test methods and materials performance criteria, fire detection and suppression systems, aircraft fuel tank explosion protection, and long-range development of ultra-fire resistant cabin materials.

Agency Outputs: The FAA issues aircraft fire safety rules that govern material selection, design criteria, and operational procedures. The new test methods, reports, and journal publications produced by the Fire Research and Safety Program describe the technical basis for these regulations and offer guidance for regulatory compliance. Through this research, which is also producing new materials and government-owned patents, FAA provides industry with state-of-the-art safety products and information.

Research Goals: The FAA will work to reduce the number of accidents and incidents caused by in-flight fire in both passenger-carrying and all-cargo (freighter) aircraft, to prevent fuel tank explosions, and to improve survivability during a post-crash fire. Near term research will focus on improved fire test standards for interior and structural materials, improved fuel tank inerting systems and extended inerting applications, and new or improved fire detection and extinguishment systems. Additionally, long-term research will be conducted to develop the enabling technology for a fireproof aircraft cabin constructed of ultra-fire resistant materials. The following milestones directly support the ultimate strategic goals of in-flight fire prevention, fuel tank explosion prevention and improved post-crash fire survivability:

- By FY 2010, develop and validate a methodology for predicting flammability of wing fuel tanks of aluminum or composite construction.
- By FY 2011, provide comprehensive fire safety guidance for high energy density lithium batteries in passenger carry-on items, shipped as cargo and in aircraft power systems.
- By FY 2012, define composite fuselage fire safety design criteria
- By FY 2013, demonstrate the improvements in post-crash fire survivability, provided by ultra-fire resistant materials using full-scale test simulations.

Customer/Stakeholder Involvement: The Fire Research and Safety Program works with the following industry and government groups:

- Aircraft Safety Subcommittee of the FAA Research, Engineering and Development Advisory Committee – These representatives from industry, academia, and other government agencies annually review the program's research activities.
- Technical Community Representative Groups – The FAA representatives apply formal guidelines to ensure that the program's research projects support new rule making and development of alternate means of compliance for existing rules.
- Aircraft manufacturers (U.S. and foreign), airlines, foreign airworthiness authorities, chemical companies, material suppliers, and aircraft fire safety equipment manufacturers meet regularly to share information on interior material fire tests and improvement of fire detection and suppression systems.
- National Transportation Safety Board (NTSB) – The FAA works with and supports NTSB on in-flight fire incidents, on-site accident investigations, and related testing.
- Pipeline and Hazardous Materials Safety Administration (PHMSA) – The FAA works with PHMSA to cooperatively develop requirements/guidelines for the safe transport of hazardous materials (current focus on lithium batteries).

R&D Partnerships: Fire Research and Safety Program R&D partners include:

- FAA-sponsored International Systems Fire Protection Working Group – R&D involves fuel tank protection, hidden fire safety, fire/smoke detectors, halon replacement, and lithium battery fire hazards.
- FAA-sponsored International Aircraft Materials Fire Test Working Group – R&D involves development and standardization of improved material fire tests.
- Interagency working group on fire and materials – promotes technology exchange among U.S. Government agencies and prevents unwarranted duplication of work.
- Interagency agreement with the National Institute of Standards and Technology – develops fire retardant mechanisms and rapid screening tools for flammability.
- Memorandum of cooperation with the British Civil Aviation Administration – R&D involves a variety of fire safety research efforts.
- Cabin safety research technical group – cooperates in and coordinates cabin safety research conducted and/or sponsored by the international regulatory authorities.
- Arrangements with Fortune 100 companies to share development costs for new fire resistant materials.

Accomplishments: The FAA operates the world's most extensive aircraft fire test facilities. The FAA certification engineers receive training in these facilities each year and, at the request of the NTSB, program personnel participate in major fire accident and incident investigations. The Fire Research and Safety Program annually publishes over two-dozen reports and papers (available to the public on-line at http://www.fire.tc.faa.gov/reports.asp) highlighting research results that have led to major improvements in aircraft safety.

Outstanding program accomplishments include:

FY 2008:

- Measured and compared the flammability of composite and aluminum wing fuel tanks under simulated flight conditions.
- Measured and compared the heat transfer from an in-flight fire in composite and aluminum fuselage constructions.
- Developed safe acute exposure limits for gaseous halocarbon extinguishing agents in ventilated aircraft
- Developed a one-dimensional thermo-kinetic burning model for combustible materials.

FY 2007:

- Developed a cabin crew training video for fighting in-flight fires.
- Characterized the flammability of epoxy-graphite structural composites.
- Developed and standardized a next generation burner for insulation burn-through resistance.
- Evaluated the flammability of non-halogen, ultra-fire resistant plastics.

FY 2006:

- Evaluated the cabin hazards caused by outgassing from a composite fuselage material subjected to a simulated post-crash fuel fire.
- Determined the fire hazards of lithium ion batteries shipped as air cargo.
- Conducted engine nacelle fire extinguishment tests to determine the suitability of a promising new environmentally friendly agent, NOVEC 1230, as a replacement for the currently used halon.

FY 2005:

- Issued the first Department of Transportation licenses to manufacture the FAA-patented microscale combustion calorimeter for evaluating the heat release rate of extremely small research samples of advanced ultra-fire resistant material.
- Developed technology to support the use of low false alarm cargo fire/smoke detectors.

Previous Years:

- Developed and demonstrated a simple and cost effective fuel tank inerting system.

- Determined the limiting concentration of oxygen to prevent fuel tank explosions.
- Developed improved and new flammability tests for thermal acoustic insulation, measuring in-flight fire resistance and post-crash burn-through resistance, respectively.
- Developed minimum performance test standards for halon replacement agents.
- Developed and demonstrated an onboard cabin water spray system for significantly improving post-crash fire survivability.

FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Fire Safety Improvements
- Developed guidance for the effective extinguishment of cabin fires involving lithium batteries in passenger carry-on items.
- Developed fire test criteria to limit the emission of hazardous gases during post-crash fire exposure of a burn-through resistant fuselage, including composite construction.
- Demonstrated the application of non-intrusive oxygen measurement technology in aircraft fuel tanks.
- Developed analytical model to predict the flammability in wing fuel tanks.

Fire Resistant Materials
- Fabricated small-scale samples of ultra-fire resistant thermoplastic components (e.g., seat tray or passenger service unit applications) and measure fire and mechanical performance; down select optimal thermoplastic materials for aircraft cabin.

FY 2010 PROGRAM REQUEST:

Ongoing Activities
- Research on in-flight fire safety will address all-cargo (freighter) aircraft and the growing problem with lithium battery fire hazards. This research responds to improved freighter fire safety recommendations issued by NTSB and the escalating incidence of lithium battery fires.
- Research related to the fire behavior of structural composites is driven by the new Boeing 787, the first large transport aircraft with a composite fuselage and wings. A number of fire safety concerns will be studied, associated with the replacement of aluminum with a combustible composite material that can burn and is a poor conductor of heat.
- Research will also continue on the improvement of existing required flammability tests and the development of new tests for novel applications of materials that may impact future aircraft fire safety; namely, new magnesium alloy seat structure which offers potential large weight savings.
- Fuel tank explosion protection research will focus on supporting the proposed introduction of fuel tank inerting systems in the U.S. Fleet, and understanding and predicting the flammability of wing fuel tanks, which is an immediate concern for aluminum and composite (e.g., B-787) constructions.
- Long term, applied research will continue to develop the enabling technology for ultra-fire resistant interior materials, and facilitate the transfer of that technology to the private sector through patents, reports, publications, and international standards. In addition, work will continue on the development of a numerical computer model to simulate full-scale aircraft fire tests to determine the improvement in post-crash fire survivability provided by ultra-fire resistant interior materials.

New Initiatives
No new initiatives are planned in FY 2010.

KEY FY 2010 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Fire Safety Improvements

- Evaluate adequacy of certification tests used to demonstrate freighter smoke/fire detection compliance with regulatory requirements.
- Determine the cost/benefit of freighter on-board fire detection and suppression systems.
- Examine the effectiveness of de-pressurization to control cargo fires in freighter aircraft.
- Evaluate the relative fire hazards of state-of-the-art fuel cell technology.
- Develop a small-scale test that measures the in-flight fire resistance of composite fuselage materials.
- Evaluate the fire hazards of magnesium alloy seat structure during full-scale post-crash fire tests.

Fire Resistant Materials

- Fabricate small-scale samples of ultra-fire resistant fabrics and foams (e.g., seat cushions application) and measure fire and mechanical performance; down select optimal fabric and foam materials for aircraft cabin.
- Extend the FAA thermal-kinetic burning model (ThermaKin) to charring materials and laminates/composites.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2008)	148,348
FY 2009 Enacted	6,650
FY 2010 Request	7,799
Out-Year Planning Levels (FY 2011-2014)	32,535
Total	$195,332

Budget Authority ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Contracts:					
Fire Research and Safety	2,570	2,816	3,355	2,961	3.495
Personnel Costs	3,379	3,588	3,650	3,443	3,940
Other In-house Costs	233	234	345	246	364
Total	6,182	6,638	7,350	6,650	7,799

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Basic	0	0	0	0	0
Applied	6,182	6,638	7,350	6,650	7,799
Development (includes prototypes)	0	0	0	0	0
Total	6,182	6,638	7,350	6,650	7,799

A11.a. - Fire Research and Safety Product and Activities	FY 2010 Request ($000)	Program Schedule					
		FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
061-110 Fire Research & Safety							
Fire Resistant Materials	337						
Fabricate/test small-scale cabin plastics		♦					
Fabricate/test small-scale cabin fabrics and foams			◊				
Evaluate improvement in post-crash fire survivability provided by ultra-fire resistant materials using full-scale fire test simulations						◊	
Demonstrate ThermaKin model for charring materials and laminates/composites			◊				
Fire Safety Improvement	3,158						
Assess need/develop improved fire test criteria for hidden materials not previously addressed		♦					
Examine aircraft lithium battery technology for fire safety risks		♦					
Develop guidance for extinguishment of lithium battery fires in passenger carry on items		♦					
Develop fire test criteria gas emissions during burn-through resistant fuselage post-crash fire exposure		♦					
Develop analytical model wing fuel tank flammability		♦					
Demonstrate oxygen measurement technology for fuel tanks		♦					
Develop and validate wing fuel tank prediction method (aluminum and composite)			◊				
Examine fuel cell technology for fire safety risks			◊				
Evaluate freighter fire detection certification tests			◊				
Determine cost/benefit of freighter detection/suppression systems			◊				
Examine effectiveness of depressurization for cargo fire control			◊				
Develop in-flight fire resistance test for composite materials			◊				
Full-scale tests on magnesium seat structure			◊				
Provide comprehensive guidance on lithium battery fire safety				◊			
Standardize composite fire tests				◊			
Develop a small-scale test for seat structure, if warranted				◊			
Define composite fuselage fire-safety design criteria					◊		
Develop fire safety improvements in freighter					◊		
Develop detection/extinguishing system to suppress hidden in-flight fires						◊	
Examine fire safety aspects of aircraft oxygen systems							◊
Personnel and Other In-House Costs	4,304						
Total Budget Authority	7,799	6,650	7,799	7,941	8,065	8,196	8,333

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A11.b.	Propulsion and Fuel Systems	$3,105,000

GOALS:
This program supports the following Flight Plan goal: Increased Safety.

Intended Outcomes: The Propulsion and Fuel Systems Program helps achieve FAA's strategic goal of increasing aviation safety by reducing the number of accidents associated with the failure of aircraft engines, components, and fuel systems. The program develops technologies, procedures, test methods, and criteria to enhance the airworthiness, reliability, and performance of civil turbine and piston engines, propellers, fuels, and fuel management systems. To improve safety, the program conducts research needed to develop tools, guidelines, and data to support improvements in turbine engine certification requirements. The program also conducts research to test new unleaded fuels and piston engine modifications to seek a safe alternative to current leaded aviation gasoline (avgas), as well as the testing and development of jet fuel made from alternative sources.

Agency Outputs: The FAA issues certification standards, Advisory Circulars, and reviews the specifications and practices recommended by recognized technical societies (ASTM International, SAE International) to maintain the airworthiness of aircraft engines, fuels, and airframe fuel management systems. The agency also publishes information and sponsors technology workshops, demonstrations, and other means of training and technology transfer. The Propulsion and Fuel Systems Program provides the technical information, R&D resources, and technical oversight necessary for the agency to enhance the airworthiness, reliability, and performance of propulsion and fuel systems.

Research Goals: There are two main research areas within the Propulsion and Fuels Program. The first to ensure the structural integrity and durability of critical rotating engine parts in turbine engines throughout their service life. This research is providing analytical tools to meet the requirements of Advisory Circular AC33.14-1, "Damage Tolerance for High Energy Turbine Engine Rotors", allowing aircraft turbine engine manufacturers to assess the risk of fracture and manage the life of rotor disks. Research is also being conducted to establish an improved understanding of other material factors and manufacturing anomalies that can shorten the fatigue life of rotor disks.

The second research area is aviation fuels. One goal is to find an unleaded replacement for current leaded avgas (100LL) used in piston engines. The replacement fuel should be equivalent in performance to 100LL and be a seamless, transparent change to a general aviation (GA) pilot. In addition, research will be conducted evaluating technologies for modification of piston engines to enable their safe operation using unleaded fuel. Extensive laboratory and test cell dynamometer engine testing will evaluate and characterize all new fuel formulations provided by industry for consideration. Lastly, research will be conducted related to developing jet fuel from alternative sources such as coal, natural gas, and biomass.

- By FY 2012, develop a design methodology for use by industry to prevent cold dwell fatigue in turbine engine rotor disks and define a technique to assess the risk of the current aircraft fleet for cold dwell fatigue.
- By FY 2012, develop a certification tool that will predict the risk of failure of rotor disks containing material and manufacturing anomalies.
- By FY 2014, evaluate the technology of modifying general aviation piston engines to run on unleaded fuels.
- Through FY 2014, evaluate and characterize all candidate replacement formulations for 100LL.
- Through FY 2014, evaluate and characterize candidate formulations for jet fuel made from alternative sources.

Customer/Stakeholder Involvement: The Propulsion and Fuel Systems Program works with the following industry and government groups:

- Subcommittee on Aircraft Safety of the Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review the program's activities.

- Technical Community Representative Groups – FAA representatives apply formal guidelines to ensure that the program's research projects support new rule making and development of alternate means of compliance with existing rules.
- The Coordinating Research Council (CRC) Unleaded Aviation Gasoline Development Group – representatives from Texaco, Exxon Mobil, Phillips Petroleum, Chevron, British Petroleum, Cessna, Raytheon (Beech), Teledyne Continental, and Textron Lycoming facilitate two-way transfer of technology between government and industry to benefit all participants.
- The CRC Molecular Marker Ad Hoc Committee – representatives from turbine engine manufacturers, major oil companies and FAA provide oversight to ensure the safe implementation when adding molecular markers to jet fuel.
- The Aerospace Industries Association (AIA) – working subcommittees on rotor integrity and rotor manufacturing.
- The National Transportation Safety Board – Recommendations A-90-89 and A-90-90 recommend that a damage tolerance philosophy be implemented in the design and maintenance of failure critical engine parts and A-98-28 recommends that FAA in cooperation with industry address the uncontained engine failures caused by cold dwell fatigue.

R&D Partnerships: Propulsion and Fuel Systems Program R&D partners include:

- Turbine Rotor Material Design Program - Southwest Research Institute (SwRI) has teamed with Pratt and Whitney, General Electric, Honeywell, and Rolls Royce to provide DARWIN™ (Design Assessment of Reliability With INspection), a probabilistic-based rotor life and risk management certification tool.
- The AIA working subcommittees on rotor integrity and rotor manufacturing.
- The Ohio State University, is conducting research on a failure mode of titanium rotor disks known as cold dwell fatigue.
- SwRI is conducting research to determine the acceptable level of fuel dye contamination allowable for the safe, continuous operation of turbine engines in partnership with the Defense Energy Support Center, Internal Revenue Service, Air Transport Association, American Petroleum Institute, General Electric Aircraft Engines, Pratt and Whitney, Rolls Royce, Honeywell and Boeing.
- CRC Unleaded Aviation Gasoline Development Group – includes Texaco, Exxon-Mobil, Phillips Petroleum, Chevron, British Petroleum, Cessna, Raytheon (Beech), Teledyne Continental, and Textron Lycoming; this group facilitates two-way transfer of technology between government and industry to benefit all participants.
- Cooperative Research & Development Agreements (CRDA) with various industry partners.
- The FAA General Aviation Center of Excellence in conjunction with direct grants with the University of North Dakota, South Dakota State University and Baylor University – these relationships produce feasibility studies for the use of ethanol fuel blends as a possible unleaded piston fuel replacement for 100LL avgas.

Accomplishments: Outstanding program accomplishments include:

FY 2008:

- Released an enhanced version of the DARWIN™ probabilistic rotor design code with capabilities for surface damage of turned surfaces and blade slots.
- Published final report on full scale engine tests of 45 fuel formulations provided by the CRC

FY 2007:

- Completed an enhanced version of the DARWIN™ code with the following new features: new analysis mode for titanium hard alpha anomalies, probabilistic treatment of multiple anomalies, and a crack formation module.
- Completed full scale engine tests of 45 fuel formulations provided by the CRC.

FY 2006:

- Continued the enhancement of the DARWIN™ probabilistic rotor design code.

- Completed research on an experimental GA fuel provided by Exxon-Mobil under a cooperative research and development agreement; results demonstrated that amine-based additives show some promise as a replacement for 100LL.
- Completed research investigating the feasibility of using ethyl tertiary butyl ether (ETBE), an ethanol fuel blend, as a GA fuel; results showed there are significant range penalties associated with this fuel that make it an undesirable replacement for 100LL.

FY 2005:

- Completed an enhanced version of the DARWIN™ code that addresses multiple subsurface defects in turbine engine rotor disks.

FY 2004:

- Populated a rotor manufacturing induced anomaly database for use by the engine industry in sharing lessons learned in the manufacture of critical rotating engine parts to prevent future accidents caused by manufacturing defects.
- Completed an industrial demonstration of the pool power controller for the vacuum arc remelting process that will aid in producing defect-free titanium material for the manufacturer of turbine engine rotor disks.
- Completed research on the performance in a GA piston engine of 30 unleaded fuel formulations specified by the CRC Unleaded Aviation Gasoline Development Group. The research showed that none of the candidate formulations match the detonation suppression capability of 100LL.

Previous Years:

- Demonstrated, verified, and industrialized the probabilistic rotor design and life management code known as DARWIN™ for titanium alloys that provides turbine engine manufacturers a tool to augment their safe life approach.
- Demonstrated and verified the DEFORM™ defect deformation code for analysis of titanium alloy defects during the rotor disk forging process.
- Proved that the fleet octane requirement is the single most critical parameter for development of high octane unleaded aviation gasoline and that the motor octane rating of any potential candidate must be 100 or greater.
- Defined detonation detection procedures that were adopted by the American Society for Testing and Materials as a test standard (ASTM D6424) for use on candidate unleaded replacement fuels.

FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Turbine Engine Research

- Released an enhanced version of the DARWIN™ probabilistic rotor design code with capabilities for automatic rotor modeling.
- Completed experiments to calibrate and verify analytical methods for time-dependent crack growth and thermo-mechanical fatigue crack growth.

Aviation Fuels and Fuel System Safety Research

- Continued laboratory characterization and engine ground testing of candidate unleaded fuels to replace 100LL avgas.
- Completed research on the effects of molecular markers in Jet A fuel with results published in a final report.

FY 2010 PROGRAM REQUEST:

Ongoing Activities

- Continue to advance DARWIN™, the probabilistically based turbine engine rotor design and life management code to enhance its predictive capability. This code is an FAA approved means to support a damage tolerant based certification enhancement to the current safe life design approach.

- Continue to develop advanced damage tolerance methods for turbine rotor disks through experimentation and modeling to address the effects of complex time-temperature stress histories, small crack sizes, anomalies in nickel alloys, crack geometries, and surface residual stress on fatigue crack growth life.
- Continue to develop a design methodology for use by industry to prevent cold dwell fatigue in turbine engine rotor disks and define a technique to assess the risk of the current aircraft fleet for cold dwell fatigue.
- Continue laboratory characterization and engine ground testing of candidate unleaded fuels to replace 100LL avgas.

New Initiatives

- Conduct research into technology of modifying general aviation piston engines to run on unleaded fuels.
- Conduct research related to developing jet fuel from alternative sources such as coal, natural gas, and biomass.

KEY FY 2010 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Turbine Engine Research

- Release an enhanced version of the DARWIN™ probabilistic rotor design code with second generation capabilities for automatic rotor modeling.

Aviation Fuels and Fuel System Safety Research

- Continue laboratory characterization and engine ground testing of candidate unleaded fuels to replace 100LL avgas.
- Conduct research into technology of modifying general aviation piston engines to run on unleaded fuels.
- Conduct research related to developing jet fuel from alternative sources such as coal, natural gas, and biomass.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2008)	97,916
FY 2009 Enacted	3,669
FY 2010 Request	3,105
Out-Year Planning Levels (FY 2011-2014)	12,824
Total	$117,514

Budget Authority ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Contracts:					
Propulsion And Fuel Systems	4,508	2,592	2,463	2,415	1,579
Personnel Costs	1,155	1,366	1,476	1,168	1,400
Other In-house Costs	78	90	147	86	126
Total	5,741	4,048	4,086	3,669	3,105

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Basic	0	0	0	0	0
Applied	5,741	4,048	4,086	3,669	3,105
Development (includes prototypes)	0	0	0	0	0
Total	5,741	4,048	4,086	3,669	3,105

A11.b. - Propulsion and Fuel Systems Product and Activities	FY 2010 Request ($000)	Program Schedule					
		FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
063-110 Propulsion and Fuel Systems							
Turbine Engine Research	1.579						
Develop certification tool that will predict the risk of failure of rotor disks containing material and manufacturing anomalies		♦	◊	◊	◊		
Release an enhanced version of the DARWIN™ probabilistic rotor design code with capabilities for automatic rotor modeling		♦					
Release an enhanced version of the DARWIN™ probabilistic rotor design code with second generation capabilities for automatic rotor modeling			◊				
Complete experiments to calibrate and verify analytical methods for time-dependent crack growth and thermo-mechanical fatigue crack growth.		♦					
Develop design methodology for use by industry to prevent cold dwell fatigue in turbine engine rotor disks and define a technique to assess the risk of the current aircraft fleet for cold dwell fatigue.		♦	◊	◊	◊		
Unleaded Fuels and Fuel System Safety Research	0						
Complete research on the effects of molecular markers in Jet A fuel.		♦					
Evaluate the technology of modifying general aviation piston engines to run on unleaded fuels		♦	◊	◊	◊	◊	◊
Evaluate and characterize all candidate replacement formulations for 100LL			◊	◊	◊	◊	◊
Evaluate and characterize candidate formulations for Jet fuel made from alternative sources			◊	◊	◊	◊	◊
Personnel and Other In-House Costs	1,526						
Total Budget Authority	3,105	3,669	3,105	3,150	3,186	3,224	3,264

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A11.c.	Advanced Materials/Structural Safety	$2,448,000

GOALS:
This program supports the following Flight Plan goal: Increased Safety.

Intended Outcomes: The Advanced Materials/Structural Safety Program helps FAA achieve its strategic goal of increasing aviation safety by preventing accidents that would occur as a result of structural failure. The Advanced Materials/Structural Safety Program assesses the safety implications of new and present day composites, alloys, and other materials, and associated structures and fabrication techniques that can help to reduce aviation fatalities. The program also develops advanced methodologies for assessing aircraft crashworthiness.

Agency Outputs: The Advanced Materials/Structural Safety Program provides technical support for rule making and develops guidance to help the aviation industry comply with agency regulations.

Advanced Materials

The FAA establishes rules for the certification of safe and durable materials for use in aircraft construction. While the rules are the same for composite or metal structures, different behavioral characteristics of structural materials call for different means of compliance. Although Advisory Circular AC 20-107A, “Composite Structure” has been published, advances in technologies and materials require periodic updates and expansion of the Advisory Circular. The FAA Chief Scientist and Technical Advisor disseminates current technical information developed in this program to regulatory personnel through technical reports, handbooks, and guidance. The goal of this data exchange is to allow regulatory processes to keep pace with industry advances and benefit from state-of-the-art technology and design. This provides the most efficient safety and certification information to the FAA certification service and industry.

Structural Safety

The FAA revises or updates crashworthiness-related Federal Aviation Regulations to accommodate new information for overhead stowage bins, auxiliary fuel tanks and fuel systems, aircraft configurations, seat and restraint systems, and human tolerance injury criteria. The FAA through this program is developing alternative methods to streamline the certification process (i.e. certification by analysis and component tests in lieu of full-scale tests).

Research Goals: To prevent accidents associated with the airframe use of advanced materials and to improve the crashworthiness of airframes in the event of accidents, the Advanced Materials/Structural Safety research focuses on developing analytical and testing methods for standardization; understanding how design, loading, and damage can affect the remaining life and strength of composite aircraft structures; developing maintenance and repair methods that are standardized and correlated with training and repair station capabilities; enhancing occupant survivability and reducing personal injury from accidents; improving crash characteristics of aircraft structures, cabin interiors, auxiliary fuel tanks, fuel systems, and occupant seat and restraint systems; and improving the efficiency of aircraft certification through the use of better analytical modeling of crash events.

- By FY 2010, generate data using full-scale structure with a goal of uniform, accepted certification methodology for damage tolerance and fatigue of composite airframe.
- By FY 2010, develop test and analysis protocols for repeated loads and damage threats.
- By FY 2011, identify required data and test methods for high temperature materials to assure safety of new constructions.
- By FY 2012, initiate study of ceramics as they are used in engine components.
- By FY 2012, establish design criteria for restraint systems that protect occupants at the highest impact levels that the aircraft structure can sustain.
- By FY 2012, define criteria for use of embedded sensors in fault tolerant structures.
- By FY 2013, develop criteria for damage tolerance assessments of laminate composite structures.

- By FY 2013, generate methodology for demonstrating aircraft structure crashworthiness certification by analysis.
- By FY 2014 evaluate threats from flight line activities on composite aircraft structures.
- By FY 2014 evaluate the ability of models to predict off-axis and multiple terrain impacts.

Customer/Stakeholder Involvement: The Advanced Materials/Structural Safety Program complies with or cooperates with the following legislation and industrial and government groups:

- Public Law 100-591, the Aviation Safety Research Act of 1988, and House of Representatives Report 100-894 – sets priorities to develop technologies, conduct data analysis for current aircraft, and anticipate problems related to future aircraft.
- The Aviation Rulemaking Advisory Committee (ARAC) – this FAA committee and its subcommittees help to ensure the effectiveness of the agency's rule making by identifying R&D requirements and priorities, providing guidance for the update of documents, such as the Advisory Circular (AC) AC20-107A, and encouraging industry's full participation in implementing new rules.
- Aircraft Safety Subcommittee of the Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review the program's activities.
- Technical Community Representative Groups – FAA representatives apply formal guidelines to ensure that the program's research projects support new rule making and development of alternate means of compliance for existing rules.

R&D Partnerships: The Advanced Materials/Structural Safety Program benefits from a close working relationship with the Joint Center of Excellence (COE) for Advanced Materials and Structures (JAMS) lead by Wichita State University and the University of Washington. The research performed under this program is leveraged by the monetary and intellectual contributions of its partners including many major commercial aviation companies.

Advanced Materials

FAA sponsors with the cooperation of other government agencies and industry, a primary, authoritative handbook (Composite Materials Handbook 17) facilitating the statistical characterization data of current and emerging composite materials. This international reference tool is the best available data and technology source for testing and analysis, and also includes guidance on data development, design, inspection, manufacturing and product usage. On recommendations by the ARAC, material data contained in this handbook are acceptable for use in the certification process.

Structural Safety

The program maintains cooperative interagency agreements in the structural safety area with the U.S. Army and Navy in the analytical modeling area.

Memoranda of cooperation and exchange of personnel have been established between the program and the French, Italian, and Japanese governments in the crash testing area. The program has worked closely with Drexel University to develop dynamic crash computer modeling codes for transport airplane structures.

Accomplishments: The Advanced Materials/Structural Safety Program provides technical reports (available on-line at http//actlibrary.tc.faa.gov), handbooks, ACs, and certification guidance to FAA organizations, aircraft manufacturers, maintainers, and operators. Outstanding program accomplishments include:

FY 2008:

- Developed chemical characterization tests to ensure adequate surface preparation for bonded joints.
- Developed safety criteria for damage tolerance of fiber/metal laminates and friction stir welded joints.
- Assessed the severity of control surface stiffness degradation and its effect on dynamic characteristics.

- Developed analytical method to evaluate anthropomorphic test device (ATD) model results for crash testing
- Completed research of computer modeling of aircraft water impacts to help determine revised rotorcraft water impact and ditching standards.

FY 2007:

- Completed the validation of analytical methodology to predict residual strength of a composite sandwich structures following an impact event.
- Established feasibility of embedded sensors to track damage in composite structures.
- Evaluated aging composite aircraft by a destructive evaluation and testing.
- Developed an updated ATR 42-300 model to analyze critical fuselage frame failure observed in the vertical drop test.
- Developed occupant protection criteria for side facing seats commonly used in business jets. Currently, no criteria exist.
- Evaluated the use of reticulated foam to mitigate post-crash fires using full-scale sled tests.

FY 2006:

- Developed software for analyzing bonded joints that can be used by the general aviation industry.
- Developed a web-based course on maintenance of composite airframe structures.
- Developed analytical models that predict durability of braided materials.
- Generated data on human neck injury criteria for side-facing aircraft seats that may be used to develop safety criteria for business jet with side-facing seats. Currently, no criteria exist for these seats.

Previous years:

- Developed an aircraft seat cushion replacement methodology that may have the potential to replace future requirement for full-scale sled test currently required when replacing aircraft seat cushions.
- Established common practices for bonded joints in composites structures that served as a basis for an Advisory Circular.
- Developed data on the procurement and processing of composites that resulted in a published Advisory Circular.
- Analyzed data from ATR42-300 drop test to help establish crashworthiness criteria for commuter aircraft.
- Developed an economical data reduction method, characterizing statistically composite materials through shared databases, that is now used worldwide by the general aviation industry.

FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Advanced Materials

- Generated composite material dynamic properties.
- Initiated studies for the types of threats to composite aircraft structures while at the service gate and on the flight line.
- Provided data to the FAA Office of Aviation Safety (AVS) in support of the revision of AC 20-107A to AC 20-107B
- Continued to develop consensus for a damage tolerance and fatigue certification protocol.

Structural Safety

- Develop analytical modeling techniques of aircraft crash conditions.
- Initiate review of the need for off axis analysis capabilities to assist in certification of structures for crashworthiness.

FY 2010 PROGRAM REQUEST:

Ongoing Activities

The program will continue to focus on damage tolerance and fatigue issues of composite airframes. In addition it will focus on the aging of composite materials. Composite control surfaces degradation on transport airplanes will be explored and linked to aircraft safety issues. Bonded joints will be studied for damage tolerance and durability. Researchers will also explore savings in maintenance costs, of using embedded sensors to monitor in-service damage and will investigate the long-term safety friction stir-welded parts and fiber/metal laminates proposed for use in new aircraft. In addition, they will collect data for new materials and applications, such as ceramics and high temperatures.

Research will continue to develop analytical models of aircraft crash events. This will focus on the development of criteria and methodologies to validate analysis techniques and assess the effectiveness of the analysis to properly describe the crash event.

New Initiatives

No new initiatives are planned in FY 2010.

KEY FY 2010 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Advanced Materials

- Verify accepted certification methodology for damage tolerance and fatigue using full-scale test data.
- Develop test and analysis protocols for repeated loads and damage threats

Structural Safety

- Develop analytical modeling techniques of aircraft structures crash conditions

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2008)	98,081
FY 2009 Enacted	2,920
FY 2010 Request	2,448
Out-Year Planning Levels (FY 2011-2014)	10,023
Total	$113,472

Budget Authority ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Contracts:					
Advanced Materials	4,383	1,211	6,054	1,838	1,368
Structural Safety	174	165	0	0	0
Personnel Costs	1,247	1,394	945	1022	1,004
Other In-house Costs	77	73	84	60	76
Total	5,881	2,843	7,083	2,920	2,448

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Basic	0	0	0	0	0
Applied	5,881	2,843	7,083	2,920	2,448
Development (includes prototypes)	0	0	0	0	0
Total	5,881	2,843	7,083	2,920	2,448

A11.c. – Advanced Materials/Structural Safety Product and Activities	FY 2010 Request ($000)	Program Schedule					
		FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
062-111 Advanced Materials Structures							
Advanced Materials	1,368						
Generate composite materials dynamic properties		♦					
Verify accepted certification methodology for damage tolerance and fatigue using full-scale test data.			◊				
Develop test and analysis protocols for repeated loads and damage threats			◊				
Identify data and test for materials at elevated temperatures				◊			
Initiate research in ceramic composites					◊		
Develop criteria for damage tolerance assessments of laminate composite structures						◊	
Evaluate threats from flight line activities on composite aircraft structures							◊
Define criteria for use of embedded sensors in fault tolerant structures.					◊		
062-110 Structural Safety	0						
Structural Safety							
Develop analytical modeling techniques of aircraft structures crash conditions		♦	◊				
Develop analytical model protocols and detailed requirements for crashworthiness certification analysis						◊	
Evaluate the ability of models to predict off-axis and multiple terrain impacts.							◊
Establish design criteria for restraint systems at highest levels that aircraft can sustain					◊		
Personnel and Other In-House Costs	1,080						
Total Budget Authority	2,448	2,920	2.448	2,476	2,495	2,515	2,537

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A11.d.	Atmospheric Hazards/Digital System Safety	$4,482,000

GOALS:
This program supports the following Flight Plan goal: Increased Safety.

Intended Outcomes: The Atmospheric Hazards/Digital System Safety Research Program supports FAA's strategic goal of increased safety by reducing the number of accidents or potential accidents associated with aircraft icing and failures to software-based digital flight controls and avionics systems in preparation for the Next Generation Air Transportation System (NextGen). The program develops and tests technologies that detect frozen contamination, predict anti-icing fluid failure, and ensure safe operations both during and after flight in atmospheric icing conditions. To improve digital system safety, researchers are proactive in ensuring the safe operation of emerging, highly complex software-based digital flight controls and avionics systems.

A major goal of the program is to reduce aviation's vulnerability to all in-flight icing hazards through the application of its research to improve certification criteria. Commercial airplanes are not yet certified to fly in icing conditions to an icing envelope that includes supercooled large droplet (SLD) icing conditions. The program's researchers have contributed to the development of technical data and advisory materials to correct this omission. A study by the Engine Harmonization Working Group indicates that over 100 in-service engine events, many resulting in power loss and at least six in multiple engine flameouts, occurred in high ice water content environments over the period 1988 to 2003. A current collaborative research effort will address this issue.

The program will develop new guidelines for testing, evaluating, and qualifying digital flight controls and avionics systems for the certification of aircraft platforms. Additionally, the program supports development of policy, guidance, technology, and training needs of the Aircraft Certification Service and Flight Standards Service that will assist and educate FAA and industry specialists in understanding digital systems safety and assessing how it may be safely employed in systems such as fly-by-wire, augmented manual flight controls, navigation and communication equipment, and autopilots.

Agency Outputs: The FAA establishes rules for the certification and operation of aircraft that encounter icing conditions as well as rules for the use of software, digital flight controls, and onboard avionics systems. The agency uses the research results to generate ACs, and various other forms of technical information detailing acceptable means for meeting requirements, to guide government and industrial certification and airworthiness specialists and inspectors.

Research Goals: To reduce the number and severity of accidents, or potential accidents, associated with icing and failures to software-based digital flight controls and avionics systems, the program develops and assesses ways to ensure that airframes and engines can safely operate in atmospheric icing conditions, and ensure the proper operation of software, complex electronic hardware, and digital systems.

Atmospheric Hazards

- By FY 2011, complete characterization of high ice water content atmospheric environments potentially hazardous to engines.
- By FY 2012, complete experimental work on the physics of engine icing in high ice water content environments.
- By FY 2013, develop methods for the airworthiness testing of engines in simulated high ice water content environments.
- By FY 2014, develop data and methods supporting the evaluation of aircraft engines for operation in high ice water content environments.

Digital System Safety

- By FY 2011, determine potential safety, security, and certification issues of connecting aircraft systems to external systems, per onboard network security and integrity.

- By FY 2011, develop new methods of evaluation for airborne electronic hardware to include semiconductor device wear out, system effects produced by microprocessors, reliability prediction, and lifecycle maintenance, while dealing with commercial off-the-shelf (COTS) technology in complex and safety-critical systems.
- By FY 2013, evaluate development and integration techniques that will produce software for complex highly integrated systems that must comply with airworthiness requirements.
- By FY 2013, evaluate complex hardware techniques and tools for qualification, verification, and assurance to develop additional evaluation methods that may improve the certification process for complex hardware.
- By FY 2013, evaluate alternatives to existing verification and validation techniques; improved techniques will provide a way to identify system requirement errors early in the development process before implementation into the system.
- By FY 2014, determine applicability of safety engineering and reliability engineering to software development assurance standards (i.e., Software Considerations in Airborne Systems and Equipment Certification (DO-178B).

Customer/Stakeholder Involvement: The Atmospheric Hazards/Digital System Safety Research Program collaborates with a broad segment of the aviation community to improve aircraft certification, inspection, and maintenance, including:

- Aircraft Safety Subcommittee of the Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review the activities of the Atmospheric Hazards/Digital System Safety Research Program.
- Technical Community Representatives Groups – FAA representatives apply formal guidelines to ensure that the program's R&D projects support new rule making and the development of alternate means of compliance with existing rules.
- Ice Protection Harmonization Working Group and Engine Harmonization Working Group of the FAA Aviation Rulemaking Advisory Committee – groups that ensure the effectiveness of the agency's rule making. Members of the working group and full committee identify research requirements and priorities.
- G-12 Aircraft Ground Deicing Committee of the Society of Automotive Engineers (SAE) – this subcommittee assists in updating holdover time guidelines and establishing standards for de/anti-icing methodologies, deicing fluids, and ground ice detection.
- SAE AC-9C Aircraft Icing (In-flight) Subcommittee – this subcommittee assists in updating the Aircraft Icing Handbook, including the Icing Bibliography, and in establishing standards for icing simulation methods.
- RTCA (formerly known as Radio Technical Commission for Aeronautics) – members of this U.S. Federal Advisory Committee and its special committees help to ensure the effectiveness of the agency's rulemaking by identifying research requirements and priorities and providing guidance for Aircraft Certification Office engineers and the update of documents, such as avionics software, and electromagnetic hazards.
- Certification Authorities Software Team (CAST) – a group of international certification software and complex electronic hardware (CEH) specialists who collaborate and make recommendations to regulatory authorities on the resolution of software and CEH aspects of safety.
- Research and Innovative Technology Administration (RITA) Volpe National Transportation Center – U.S. DOT organization that is leading information security research for U.S. transportation and is providing collaborative research inputs for the FAA research in aeronautical system security that supports the onboard network security goal.

R&D Partnerships: The program maintains a number of cooperative relationships:

- NASA Glenn Research Center – includes various cooperative efforts on aircraft icing activities.
- Transport Canada – based on an international agreement on research on aircraft ground deicing issues.
- Environment Canada – based on an international memorandum of cooperation for research on in-flight icing conditions.

- Aerospace Vehicle Systems Institute (AVSI) – cooperative industry, government, and academia venture for investigation and standardization of aerospace vehicle systems to reduce life-cycle cost and accelerate development of systems, architectures, tools, and processes.

Accomplishments: Significant program accomplishments include:

Aircraft Icing

FY 2008:

- Completed analysis of data from propeller icing test at McKinley Climatic Laboratory to provide data for guidance to ensure safe flight of propeller aircraft in icing conditions.
- Continued research to characterize high ice water content environments for engines to ensure their safe operation in such conditions.
- Continued experimental work on the physics of engine icing in high ice water content environments
- Developed improved methods for simulation of ice pellet, mixed, and other conditions for determination of fluid failure and holdover times.
- Continued study of aerodynamic effects of runback ice for thermal ice protection for simulated flight conditions.

FY 2007:

- Conducted propeller icing test in McKinley Climatic Chamber and processed and published data.
- Conducted testing at flight Reynolds numbers on full-scale airfoil model of simulated runback ice for a thermal ice protection system.
- Developed technical data for the use of ground ice detectors.

FY 2006:

- Developed snow generation system to test the time of effectiveness of modern de/anti-icing fluids in a controlled laboratory environment.
- Completed development of facility simulation capability for SLD icing testing to show safe operation in SLD environments in accordance with new proposed rules.
- Completed documentation and analysis of residual and inter-cycle ice for pneumatic boots at low airspeeds to provide data for guidance to ensure safe operation of pneumatic boots on low speed aircraft in icing conditions.

FY 2005:

- Investigated and documented characteristic features of runback ice for thermal ice protection systems to provide data for guidance to ensure safe operation of thermally protected aircraft in icing conditions.
- Enhanced in-flight icing simulation capability at the McKinley Climatic Laboratory suitable for testing of full scale engines and rotor blades for substantiation of safe operation of engines and helicopters in icing conditions.

FY 2004:

- Investigated and analyzed atmospheric icing environment - supercooled water and mixed-phase conditions – to provide data for formulation of expanded atmospheric icing envelopes for new proposed rules.

Digital System Safety

FY 2008:

- Determined additional microprocessor evaluation issues pertaining to risk and safety that included advancing past the stage of the use of a feature modeling approach to assure microprocessor system safety to a system-level behavioral approach; results used to provide important inputs into a Microprocessor Selection and Evaluation Concepts Document.
- Evaluated Phase 3 onboard network security and integrity issues, Aeronautical Security Requirements to Ensure Aircraft Safety, which provided the Phase 4 inputs of airworthiness

security analysis, electronic maintenance security procedures for aircraft, cyber security for unmanned aircraft systems, and inputs for Phase 4. The results are essential for the continuation Phase 4 effort, development of RTCA SC-216 (Aeronautical Systems Security) minimum aviation system performance standards, and assurance/assessment processes and methods.

- Evaluated CEH tools to determine the major safety issues in the qualification process and CEH items for sufficiency of verification coverage analysis that includes development of criteria. The results used for developing policy and guidance.

FY 2007:

- Completed research of COTS component integration and verification for integrated modular avionics (IMA) systems on a generic aviation platform. The results are useful for FAA and industry practitioners of integrating IMA systems on aircraft, and will lead to more effective systems development and enhance the certification of digital flight controls and avionics systems. The results are published in a technical report and handbook.
- Developed and documented evaluation criteria for airworthiness of newly proposed databases that will define a suitable approach to develop and evaluate data networks for safety-critical avionics; results will provide guidance to FAA certification engineers.
- Defined and documented a safe, secure process for implementing LANs onboard aircraft; results will provide a network assurance process for FAA certification engineers.

FY 2006:

- Completed research on object-oriented technology (OOT) in aviation that will provide input for policy and guidance on the use of OOT systems and support harmonization with international certification authorities on the use of OOT.
- Evaluated the criteria and use of microprocessors in aviation and the identification of safety concerns for microprocessors; results will be used to develop test methods for modern, complex microprocessors that will improve the process of certifying aircraft avionics.

Previous Years:

- Studied deterministic operations of Ethernet equipment and provided evaluation criteria for the certification of Ethernet databases; results were incorporated into a handbook that provides network designers with guidelines for developing Ethernet databases that will be deployable in certifiable avionics systems.
- Completed research on software development tools that led to a handbook for developers and certifying authorities to use to evaluate the tools from the system and software safety perspective and provided a basis for future software development tool qualification guidelines.
- Completed research on software verification tools that identified specific evaluation criteria that could be used to determine whether the performance of the tool was acceptable and thereby improve the ability of the certification engineer to qualify software using these tools.

FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Aircraft Icing

- Continued collaborative flight research to acquire atmospheric data for high ice water content environments.
- Continued experimental work on the physics of engine icing in high ice water content environments.
- Completed the development of methods for simulation of ice pellet and mixed conditions for determination of fluid failure and holdover times.
- Began development of methods to test engines in simulated high ice water content environments.
- Completed investigation of runback ice formation and size and velocity effects on aerodynamic impact of runback ice for thermal ice protection for simulated flight conditions.

Digital System Safety

- Completed an additional microprocessor evaluation pertaining to risk and safety that includes a Microprocessor Selection and Evaluation Handbook that will be used by the FAA and industry to assure the safety of aircraft microprocessor systems.
- Completed the first phase of CEH techniques and tools for qualification, verification, and assurance that will be used to develop policy and guidance.
- Evaluated Phase 4 onboard network security and integrity issues to identify potential security vulnerabilities to aircraft, proposes protection requirements, and applies previous research in data networks, Ethernet, and COTS software and airborne electronics.
- Evaluated COTS technology in complex and safety-critical systems for obsolescence and life cycle maintenance of aviation electronics to improve compliance to airworthiness directives through a better recognition of availability and affordability of parts and better ways to implement corrective actions.
- Evaluated verification and validation techniques for safety-critical digital systems to ensure that they comply with regulations and perform their intended functions under all foreseeable operating conditions.
- Investigated the feasibility of using reverse engineering as a viable alternate means of compliance for achieving objectives of DO-178B versus what has become the standard approach to software development assurance. Cover gaps in compliance with DO-178B and mitigate safety issues resulting from these gaps.

FY 2010 PROGRAM REQUEST:

Ongoing Activities

Researchers will continue to refine laboratory methods to determine de-icing fluid holdover times in a variety of environmental conditions. Will study the enhancement and validation of icing simulation methods, with an emphasis on engine testing in high ice water content conditions will continue. Researchers will also continue to evaluate onboard network security and integrity issues, integration and development techniques for highly-integrated aircraft systems, COTS technology in complex and safety-critical systems, and verification and validation techniques.

New Initiatives

None.

KEY FY 2010 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Aircraft Icing

- Begin analysis of data for characterization of high ice water content environments potentially hazardous to engines.
- Continue experimental work on the physics of engine icing in high ice water content environments.
- Complete the development of methods for simulation of ice pellet and mixed conditions for determination of fluid failure and holdover times.
- Continue development of methods to test engines in simulated high ice water content environments.

Digital System Safety

- Evaluate Phase 5 onboard network security and integrity issues to insure security protection requirements are consistent with aircraft safety.
- Continue to evaluate COTS technology in complex and safety-critical systems for obsolescence and life cycle maintenance of aviation electronics.
- Determine software development assurance level for highly integrated aircraft systems.
- Continue to evaluate verification and validation techniques for safety-critical digital systems.

- Evaluate model-based development criteria considered by industry and address technical and certification issues.
- Complete investigation into the feasibility of using reverse engineering as a viable alternate means of compliance for achieving objectives of DO-178B.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2008)	90,393
FY 2009 Enacted	4,838
FY 2010 Request	4,482
Out-Year Planning Levels (FY 2011-2014)	18,226
Total	$114,365

Budget Authority ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Contracts:					
Digital System Safety	232	842	737	1,080	1,158
Atmospheric Hazards	1,287	1,316	1,052	1,811	1,526
Personnel Costs	1,786	1,614	1,653	1,832	1,660
Other In-house Costs	102	76	132	115	138
Total	3,407	3,848	3,574	4,838	4,482

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Basic	0	0	0	0	0
Applied	3,407	3,848	3,574	4,838	4,482
Development (includes prototypes)	0	0	0	0	0
Total	3,407	3,848	3,574	4,838	4,482

A11.d. – Atmospheric Hazards/Digital System Safety Product and Activities	FY 2010 Request ($000)	Program Schedule					
		FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
064-110 Digital System Safety							
Digital System Safety	1,158						
Complete an additional microprocessor evaluation pertaining to risk and safety		♦					
Evaluate CEH techniques and tools for qualification, verification, and assurance		♦			◊	◊	
Evaluate onboard network security and integrity		♦	◊	◊			
Evaluate COTS technology in complex and safety-critical systems		♦	◊	◊			
Determine software development assurance level			◊	◊	◊	◊	
Evaluate verification and validation techniques		♦	◊	◊	◊	◊	
Evaluate model-based development criteria			◊	◊			
Investigate the feasibility of using reverse engineering.		♦	◊				
Determine applicability of safety engineering and reliability engineering				◊	◊	◊	◊
064-111 Atmospheric Hazards							
Aircraft Icing	1,526						
Characterize high ice water content atmospheric environments for engines		♦	◊	◊			
Conduct experimental work on the physics of engine icing in high ice water content environments.		♦	◊	◊	◊		
Develop improved methods for simulation of ice pellet, mixed, and other conditions for determination of fluid failure and holdover times		♦					
Develop methods to test engines in simulated high ice water content environments		♦	◊	◊	◊	◊	
Investigate formation and aerodynamic effects of runback ice for thermal ice protection for simulated flight conditions.		♦					
Develop data and methods supporting the evaluation of aircraft engines for operation in high ice water content environments				◊	◊	◊	◊
Personnel and Other In-House Costs	1,798						
Total Budget Authority	4,482	4,838	4,482	4,521	4,545	4,568	4,592

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A11.e.	Continued Airworthiness/Aging Aircraft	10,944,000

GOALS:
This program supports the following Flight Plan goal: Increased Safety.

Intended Outcomes: The Continued Airworthiness/Aging Aircraft Program (formerly known as the Aging Aircraft Program) contributes to FAA's strategic goal of increasing aviation safety by reducing the number of accidents associated with failure of aircraft structure, engines, and systems. The program develops technologies, procedures, technical data, and performance models to prevent accidents and mitigate accident severity related to civil aircraft failures as a function of their continued operation and usage. The program is focused on the structural integrity of fixed wing aircraft and rotorcraft, continued safety of aircraft engines, development of inspection technologies, and safety of electrical wiring interconnect systems (EWIS), mechanical systems, and flight controls.

Agency Outputs: The FAA issues rules and advisory materials for regulating aircraft design, construction, operation, modification, inspection, maintenance, repair, and safety. Technologies, procedures, technical data, and analytical models produced by the Continued Airworthiness/Aging Aircraft Program provide a major source of technical information used in developing these regulations and related advisories. Through this research, FAA also provides the aviation community with critical new safety technologies and data.

Research Goals: The goal of the Continued Airworthiness/Aging Aircraft Program is to understand and develop methods to counter the effects of age and usage on the airworthiness of an aircraft over its lifetime, including potential effects of modifications and repairs. The program conducts research, develops technologies and processes, and assesses current practices in order to eliminate or mitigate the potential failures related to aircraft aging processes, thereby reducing the number and severity of accidents.

To satisfy these goals the program conducts research to assess causes and consequences of airplane structural fatigue, corrosion, and other structural failures, and develop effective analytical tools to predict the behavior of these conditions. This includes development of nondestructive inspection (NDI) technologies to detect these conditions. Similar research is conducted on aircraft engines and rotorcraft. Aircraft systems research to understand the causes and consequences of EWIS and mechanical systems failures, and the relationship of these failures to other aircraft systems and safety completes the program.

- BY FY 2011, complete a study of safe life and risk-based fleet management for small-airplane continued operational safety.
- BY FY 2011, assess performance of in-situ damage detection technologies for inspection of remote and inaccessible areas in aircraft. In-situ monitoring provides the means to monitor structural behavior and identify damage not normally found between major maintenance checks.
- By FY 2011, complete study to assess need for new rudder design standards in transport category aircraft and need for new pilot training standards with regard to rudder usage.
- BY FY 2012, assess performance of traditional and advanced inspection systems necessary for evaluating the strength of bonded aircraft structures. The continued airworthiness of bonded aircraft structures, whose use is increasing, will require technologies to find hidden damage in these joints.
- By FY 2013, develop technical data on rotorcraft that provide guidance for certification of Health and Usage Monitoring Systems (HUMS) for usage credits.
- By FY 2013, develop a predictive methodology for damage tolerance risk assessment and risk management for continued operational safety of small airplanes.

Customer/Stakeholder Involvement: The Continued Airworthiness/Aging Aircraft Program coordinates with an extensive network of government and industry groups, including:

- Subcommittee on Aircraft Safety of the Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review program activity, progress, and plans.

- Technical Community Representative Groups – FAA representatives apply formal guidelines to ensure that the program's research projects support new rule making and the development of alternate means of compliance with existing rules.
- Aviation Rulemaking Advisory Committees – industry representatives propose cost-effective rulemaking and research to address aircraft safety issues.
- Aircraft manufacturers, operators, foreign airworthiness authorities, academia, and industry trade groups consult on a wide range of current and future aging aircraft and continued airworthiness issues.

R&D Partnerships: The Continued Airworthiness/Aging Aircraft Program activities are closely coordinated with industry, NASA, and the Department of Defense (DoD). The FAA maintains interagency agreements with NASA, the U.S. Navy, the U.S. Air Force, and the Department of Energy. The FAA, DoD, and NASA have co-sponsored 11 joint Aging Aircraft Conferences.

The FAA collaborates closely with several private and public organizations, including:

- The National Rotorcraft Technology Center – comprised of the U.S. Army, U.S. Navy, FAA, and NASA.
- Metallic Materials Properties Development and Standardization (MMPDS) Government/Industry Steering Group – a joint government and industry working group that funds and develops the metallic materials properties handbook.
- Cooperative Research and Development Agreement with Boeing for joint research on structural integrity of bonded repair technologies.

Accomplishments: The Continued Airworthiness/Aging Aircraft Program conducts a broad array of projects to meet the goals described above. Technical reports documenting the accomplishments of most projects are available on-line at http://actlibrary.tc.faa.gov.

Outstanding program accomplishments include:

FY 2008:

- Developed software for predictive methodology for the risk assessment and risk management of small airplane continued operational safety with regard to fatigue crack initiation.
- Completed assessment of reliability of various advanced inspection technologies in detecting second layer cracks in typical transport aircraft fuselage structure.
- Completed validation and demonstration of HUMS processes and methods for flight regime recognition on Bell 206 rotorcraft using the HUMS AC.
- Completed initial study on certification standards and design issues for rudder control systems.
- Completed an advanced risk assessment tool for conducting hazard analysis of EWIS systems. The tool used a probabilistic method to support compliance with FAR 25.1309 requirements.

FY 2007:

- Completed the airworthiness evaluation of an aged Raytheon Beech 1900D.
- Completed the destructive and extended fatigue testing of fuselage sections from a retired Boeing 727. Results support formulation of policy on use of teardown data for airworthiness certification.
- Conducted the field test of a magnetic carpet probe for rapid and wide-area inspection of aircraft engine critical rotating components.
- Completed assessment of ASTM and new fatigue crack growth test methods for use in addressing rotorcraft fatigue life.
- Developed methodology to evaluate mechanical systems on current transport category aircraft for safety and reliability.

FY 2006:

- Completed development of the MMPDS Handbook of FAA accepted material properties, which replaces MIL-HDBK-5 previously cancelled by the DoD. The MMPDS Handbook is an essential reference for aircraft manufacturer design engineers and is used by FAA for aircraft certification.
- Completed aircraft wire degradation research on common types of aircraft electrical wire as a function of laboratory controlled aging processes. Data generated are used to evaluate potential methods of monitoring wire performance in aircraft and wire reliability assessment methods.
- Completed research on the use of composite doublers as a safer, more cost-effective means for repair of damaged metallic aircraft structure.
- Completed development of a low cost, field prototype, generic scanning and imaging system that can be readily coupled to existing aircraft inspection devices, thereby improving flaw detection in metal and composite structure.
- Completed second-phase development of a magnetic carpet probe for rapid and wide-area inspection of aircraft engine critical rotating components. This technology is a potential replacement of fluorescent penetrant inspection (FPI).

FY 2005:

- Completed airworthiness evaluations of two aging Cessna airplanes, a 402A and 402C, and a teardown evaluation of a T-34A accident aircraft.
- Evaluated and verified methods to assess multiple site damage.
- Developed the fatigue crack growth database that is used in support of damage tolerance assessments of airframe structure.
- Developed and demonstrated a prototype micro-energy, high-voltage nondestructive test method for inspecting aircraft wiring.
- Completed research to determine the interrelationship of landing gear lateral loads on the body and wing gear during ground turns of FAA's multiple main gear B-747SP aircraft. Results of this research support development of landing gear certification standards.

Previous Years:

- Established the FAA Arc Fault Evaluation Laboratory and initiated the evaluation of advanced circuit protection technologies and experiments to quantify damage created by arc fault conditions.
- In cooperation with industry, developed, validated, and facilitated the adoption of improved inspection procedures for detecting cracks and corrosion in rotorcraft.
- Demonstrated phased array inspection technology for critical engine titanium forgings. Phased array technology reliably detects smaller material flaws in critical engine component forgings.
- Developed rotorcraft component damage part database that allows determination of the origin and causal factors of rotorcraft structure and component failures.
- Developed and flight tested aircraft arc-fault circuit breaker prototypes; they mitigate the hazardous effects of potentially catastrophic arc-faults.

FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Developed a comprehensive analysis tool for the risk assessment and risk management of small airplane continued operational safety with regard to fatigue crack initiation.
- Completed studies to quantitatively determine the impact of process variables on the performance of FPI and integrate results into industry inspection standards.
- Developed technical data for a draft rotorcraft HUMS certification plan to substantiate HUMS AC.
- Conducted research on advanced NDI technologies for composite structures and for evaluation of the strength of bonded structures.
- Continued research on damage tolerance and durability issues for emerging structural technologies to ensure safety, support maintenance, and support future certification policies and guidance.
- Completed initial evaluation of thermal acoustic technology as a potential replacement for FPI in inspecting critical engine components.

- Completed nondestructive evaluation of manufacturing-induced anomalies in critical engine components.
- Completed testing of single-element, dual-load-path flight control linkages from transport category aircraft for corrosion and other anomalies that could affect safety.
- Completed upgrade of Arc Fault Evaluation Laboratory to accommodate more sophisticated separation and segregation testing of aircraft wiring (EWIS research).

FY 2010 PROGRAM REQUEST:

Ongoing Activities

The FY 2010 funding request will support Continued Airworthiness/Aging Aircraft research requirements that contribute to FAA's aviation safety goal. The program will continue its focus on developing technologies, technical information, procedures, and practices that help ensure the safety of aircraft structures and systems in the civil aircraft fleet. Research will continue on the development of certification processes for health and usage monitoring systems for rotorcraft. Research will continue on the development and evaluation of risk assessment and risk management methods for the continued operational safety of small airplanes. Research will continue on flight controls and mechanical systems, focusing on design, maintenance and pilot training to increase safety. Researchers will also continue efforts on investigation of nondestructive evaluation techniques for critical engine components. Research on nondestructive inspection of structures will continue its focus on the development of methods and technologies to assure the long term safety of metallic, composite, and bonded structures.

KEY FY 2010 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Continue development of probabilistic structural risk assessment and risk management methodologies for small airplanes.
- Continue damage tolerance and durability research for emerging structural technologies such as integral structure fabricated by friction stir welding to ensure safety, support maintenance, and support future policies and guidance.
- Develop technical data for certification process for rotorcraft health and usage monitoring systems using condition-based maintenance approach for mechanical systems.
- Complete interim reliability assessments of conventional and advanced inspection devices to detect hidden flaws in thick, complex composite laminates.
- Complete study on usage, design, and training issues for rudder control systems in transport aircraft.
- Develop advisory guidance and recommendations for the separation and segregation of EWIS in transport aircraft.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2008)	390,955
FY 2009 Enacted	14,589
FY 2010 Request	10,944
Out-Year Planning Levels (FY 2011-	44,300
Total	$460,788

Budget Authority ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Contracts:					
Aging Aircraft	14,881	14,211	11,680	9,839	6,847
Personnel Costs	4,631	4,159	3,946	4,447	3,831
Other In-house Costs	295	251	320	303	266
Total	19,807	18,621	15,946	14,589	10,944

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Basic	0	0	0	0	0
Applied	19,807	18,621	15,946	14,589	10,944
Development (includes prototypes)	0	0	0	0	0
Total	19,807	18,621	15,946	14,589	10,944

A11e –Continued Airworthiness/Aging Aircraft Product and Activities	FY 2010 Request ($000)	Program Schedule					
		FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
065-110 Continued Airworthiness							
Structural Integrity and Inspection Systems Research	4,637						
Develop risk-based fleet management methods for small-airplane continued operational safety		♦	◊	◊	◊	◊	
Conduct research on application of damage tolerance methods to emerging structural technologies		♦	◊	◊	◊		
Assess the effect of FPI process variables on inspection performance and reliability		♦					
Assess performance of in-situ damage detection technologies for inspection of remote and inaccessible areas in aircraft		♦	◊	◊			
Investigate advanced NDI systems for composite and bonded structures.		♦	◊	◊	◊	◊	◊
Rotorcraft Structural Integrity and Safety	1,579						
Establish guidance for certification of HUMS applications for usage credits		♦	◊	◊	◊	◊	
Continued Airworthiness of Aircraft Engines	526						
Evaluate thermal acoustic technology as a potential replacement of FPI for critical engine components		♦					
Evaluate advanced techniques to detect manufacturing-induced surface anomalies on critical engine components		♦					
Continued Airworthiness of Aircraft Systems	105						
Provide technical guidance on pilot rudder usage, design, and training issues for certification standards		♦	◊	◊			
Assess single element, dual-load path flight control linkages for corrosion		♦					
Assess EWIS separation and segregation standards and develop advisory guidance		♦	◊				
Personnel and Other In-House Costs	4,097						
Total Budget Authority	10,944	14,58 8	10,944	11,022	11,057	11,092	11,129

Budget Item	Program Title	Budget Request
A11.f.	Aircraft Catastrophic Failure Prevention Research	$1,545,000

GOALS:
This program supports the following Flight Plan goal: Increased Safety.

Intended Outcomes: The Aircraft Catastrophic Failure Prevention Program supports FAA's strategic goal of increasing aviation safety by reducing the number of fatal accidents from uncontained engine failures and engine malfunctions. The program develops technologies and methods to assess risk and prevent occurrence of potentially catastrophic defects, failures, and malfunctions in aircraft, aircraft components, and aircraft systems. Its researchers assess the use of advanced materials to protect aircraft critical systems and passengers in the event of catastrophic engine failures. The program also uses historical accident data and National Transportation Safety Board recommendations to examine and investigate:

- Turbine engine uncontainment events, including the mitigation and modeling of aircraft vulnerability to uncontainment parameters stated in AC 20-128, Phase II.
- Fan blade out analysis and other engine related impact events like bird strike and ice ingestion.
- Propulsion malfunction indications in response to Aerospace Industries Association (AIA) recommendations and proposed solutions.

Agency Outputs: With technical data from the Aircraft Catastrophic Failure Prevention Program, FAA establishes certification criteria for aircraft and revises regulations to certify new technologies. The agency also publishes ACs to outline acceptable means for meeting these rules. The program's objective is to ensure safe aircraft operation in the public domain.

Research Goals: To reduce the number of fatal accidents from uncontained engine failures, the program develops data and methods for evaluating aircraft vulnerability to uncontained engine failures and provides analytical tools for protecting identified critical systems that may need shielding from uncontained engine debris. Through the LSDYNA Aerospace Users Group, FAA is working with industry to establish standards for finite element analysis and guidance for use in support of certification.

- By 2010, develop a modular Uncontained Engine Debris Damage Assessment Model (UEDDAM) (version 4) to be compatible with Department of Defense code upgrades for supportability and incorporate industry recommended improvements.
- Continue through 2014, the FAA/NASA/Industry sponsored quality control program for modeling aircraft impact problems.
- By 2013 develop and verify a generalized damage and failure model with regularization (MAT 224) for aluminum and titanium materials impacted during engine failure events.

Customer/Stakeholder Involvement: The program collaborates with a broad cross section of the aviation community, including:

- Subcommittee on Aircraft Safety of the Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review the program's activities.
- Technical Community Representative Groups – FAA representatives apply formal guidelines to ensure that the program's research projects support new rule making and development of alternate means of compliance with existing rules.
- The Aviation Rulemaking Advisory Committee (ARAC) – helps to ensure the effectiveness of the agency's rule making. Members of the subcommittee and full committee identify research requirements, priorities, and provide guidance for the update of documents such as AC20-128, and encourage industry's full participation in implementing new rules.

R&D Partnerships: The Aircraft Catastrophic Failure Prevention Program partners with industry and other government agencies including:

- NASA and industry in support of the development and validation of explicit finite element analysis. The industry participates in the LSDYNA Aerospace Users Group to support quality control reviews of the code and also critique research objectives in material testing, model development and verification. NASA and FAA are teamed to develop high quality test data and analytical models that support the Aerospace Users Group efforts. The end goal is to develop guidance for the use of LS-DYNA in the certification process.

- The AIA Transport Committee – with participation of FAA and industry, has examined propulsion system malfunctions, identified inappropriate crew response, and recommended development of specific regulations and advisory materials to correct safety hazards.

Accomplishments: Results of Aircraft Catastrophic Failure Prevention Program research provide the technical basis for FAA rule changes and new or modified ACs. Researcher results are also provided to airframe and engine manufacturers and designers.

Engine Uncontainment Research

FY 2008:

- Continue FAA/NASA/Industry sponsored quality control program for modeling aircraft problems in the manufacturer's supported finite element code (LSDYNA)
- Continue to improve material models for incorporation into the LSDYNA code that are verified and accepted by the aerospace users group as standardized models.

FY 2007:

- Complete testing and modeling of fabrics used in gas turbine engine containment systems. Test results will be compared with analytical results from fabric model version 3.1
- Complete testing and material model development for aluminum using the Johnson-Cook formula.
- Develop an oversight process for generic aerospace problems run in LSDYNA that ensures consistent results as computers and programs continue to evolve.

FY 2006:

- Delivered the UEDDAM, version 3.0 for evaluation of uncontained engine debris hazards to aircraft. UEDDAM uses a Monte Carlo approach to perform the vulnerability analysis in design cases where the released multiple fragments are analyzed.
- Conducted a workshop for the Department of Defense and ARAC on UEDDAM in November 2005.

FY 2005:

- Developed fabric attachment data and designs for fuselage shielding. Fabric material models were used to design full scale shields to be tested in an aircraft fuselage.
- Completed full-scale fabric shielding demonstration test of various fabric attachment designs in a retired commercial airplane at Naval Air Warfare Center (NAWC), China Lake.

Previous Years:

- Conducted a workshop for engine certification engineers on non-linear finite element modeling of turbine engine containment systems at the Los Angeles Aircraft Certification Office (ACO).
- Completed a collaborative effort with NASA, the U.S. Navy, and the U.S. Air Force to perform the first full-scale engine disk crack detection demonstration.
- Developed test data and improved analytical modeling of fabric shielding with revision to the fabric material model.
- Conducted a workshop for engine certification engineers on non-linear finite element modeling of turbine engine containment systems at the Boston ACO.
- Developed a significant database of small and full-scale test data to understand the interaction of multiple ballistic fabric layers in engine fan blade out containment systems.

Propulsion Malfunction

FY 2008:

- Continue to develop an information-based oil display system.

FY 2007:

- Completed detailed study of propulsion malfunctions classified as mechanical damage. Research developed a set of indications that can be added to the flight deck as indications and annunciations to inform the crew that a malfunction exists on a specific engine. This effort recommended a focused follow-on effort to study an information based oil system display.

FY 2005:

- Completed detailed study of propulsion malfunctions classified as Sustained Thrust Anomalies. Research developed a set of indications that can be added to the flight deck as indications and annunciations to inform the crew that a malfunction exists on a specific engine.

Previous Years:

- Completed an in-depth analysis of 80 in-service propulsion system malfunctions and developed recommendations for potential propulsion indication improvement.

FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Continued FAA/NASA/industry sponsored quality control program for modeling aircraft problems in the manufacturer's supported finite element code (LSDYNA).
- Completed testing of 2024 aluminum necessary to populate the new Material Model 224 failure map in LS-DYNA.
- Propulsion malfunction research completed a demonstration of the information-based display for the engine lubrication system.

FY 2010 PROGRAM REQUEST:

Ongoing Activities

Research will continue on the NASA/FAA/industry program for modeling aircraft engine failures in LSDYNA. The FAA/NASA/academia will continue to evaluate improved material models and incorporate them into LSDYNA upon acceptance by the Aerospace Users Group. Users' guidelines and training will continue to be developed and made available through George Washington University.

New Initiatives

No new initiatives are planned in FY 2010.

KEY FY 2010 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Engine Uncontainment Research

- Continue FAA/NASA/industry sponsored quality control program for modeling aircraft problems in the manufacturer's supported finite element code (LSDYNA).
- Complete development of Material Model 224 for fragments impacting 2024 aluminum structure.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2008)	36,074
FY 2009 Enacted	436
FY 2010 Request	1,545
Out-Year Planning Levels (FY 2011-2014)	6,268
Total	$44,323

Budget Authority ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Contracts:					
Aircraft Catastrophic Failure Prevention Research	2,703	947	1,684	0	947
Personnel Costs	566	533	482	415	555
Other In-house Costs	37	32	36	21	43
Total	3,306	1,512	2,202	436	1,545

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Basic	0	0	0	0	0
Applied	3,306	1,512	2,202	436	1,545
Development (includes prototypes)	0	0	0	0	0
Total	3,306	1,512	2,202	436	1,545

A11.f. - Aircraft Catastrophic Failure Prevention Research Product and Activities	FY 2010 Request ($000)	Program Schedule					
		FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
066-110 Aircraft Catastrophic Failure Prevention Research							
Engine Uncontainment Research	947						
Continue FAA/NASA/industry sponsored quality control program for modeling aircraft problems in the manufacturer's supported finite element code (LSDYNA)		♦	◊	◊	◊	◊	◊
Complete testing of 2024 aluminum necessary to populate the new Material Model 224 failure map in LS-DYNA.		♦					
Complete development of Material Model 224 for fragments impacting 2024 aluminum structure			◊				
Develop modular UEDDAM Code (version 4)			◊				
Complete verification of MAT 224 for Aluminum and Titanium						◊	
Propulsion Malfunction	0						
Demonstrate an information based cockpit display for the engine lubrication system		♦					
Personnel and Other In-House Costs	598						
Total Budget Authority	1,545	436	1,545	1,557	1,564	1,570	1,577

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Target-Level Request
A11.g.	Flightdeck/Maintenance/System Integration Human Factors	$7,128,000

GOALS:
This program supports the following Flight Plan goals: Increased Safety and Greater Capacity.

Intended Outcomes: The Flightdeck/Maintenance/System Integration Human Factors Program helps achieve FAA's Flight Plan goals for increased safety and greater capacity by:

- Developing more effective methods for pilot, inspector, and maintenance technician training.
- Enhancing the understanding and application of risk and error management strategies in flight and maintenance operations.
- Increasing human factors considerations in certifying new aircraft and in equipment design and modification.
- Improving pilot, inspector, and maintenance technician task performance.
- Developing requirements, knowledge, guidance, and standards for design, certification, and use of automation-based technologies, tools, and support systems.
- Addressing human task/performance and human-system task/performance requirements associated with transitioning NextGen capabilities.

Agency Outputs: The Human Factors Research and Engineering Program provides the research foundation for FAA guidelines, handbooks, advisory circulars, rules, and regulations that help to ensure the safety and efficiency of aircraft operations. It also develops human performance information that the agency provides to the aviation industry for use in designing and operating aircraft, and training pilots and maintenance personnel.

Research Goals:
By FY 2012:

- Develop flight path and energy state management guidance for air carrier flight deck training systems and procedure design.
- Provide human factors guidance for ADS-B equipment design and operation
- Provide human factors guidelines for advanced instrument procedure design and use.
- Provide guidance for fatigue mitigation in the maintenance environment
- Define the work, task, education, and training requirements for the NextGen era aircraft maintenance technician.
- Address human automation integration issues regarding the certification of pilots, procedures, training, maintenance, and equipment associated with enhanced CNS/ATM operations necessary to achieve NextGen capabilities

Customer/Stakeholder Involvement: Program researchers work directly with colleagues in FAA, other government agencies, academia, and industry to support the following R&D programs and initiatives:

- NASA's Aviation Safety Program.
- The FAA's Voluntary Safety Program Office initiatives including Advanced Qualification Program (AQP), Flight Operations Quality Assurance (FOQA), and Aviation Safety Action Program (ASAP).
- The FAA/Industry Safer Skies initiative – analyzes U.S. and global data to find the root causes of accidents and proposes the means to prevent their occurrence.
- The FAA Research, Engineering and Development Advisory Committee – Representatives from industry, academia, and other government agencies annually review the activities of the program and provide advice on priorities and budget.

R&D Partnerships: The Flightdeck/Maintenance/System Integration Human Factors Program collaborates with industry and other government programs through:

- Joint Safety Analysis Teams and Joint Safety Implementation Teams within the Safer Skies Agenda – coordinated with NASA and industry, these efforts stress human factors issues in developing intervention strategies for the reduction of air carrier and general aviation accidents.
- DoD Human Factors Engineering Technical Advisory Group – FAA participates in this group to promote a joint vision for automation and related technical areas.
- Domestic and international aviation maintenance industry partners like Boeing, Continental Airlines, British Airways, and the International Association of Machinists– the emphasis is on achieving research results that can be applied to real-world problems.
- Society of Automotive Engineers G-10 subcommittees – FAA participates on all of the Society's subcommittees involving human factors to adapt their findings to aviation standards, guidelines, etc.
- Twenty-one FAA grants to universities supporting research on air carrier training, flight deck automation, aviation accident analysis, general aviation, and aviation maintenance technician and inspector training.

Accomplishments: The program's accomplishments include:

FY 2008:

- Conducted research and provided results to SAE International Aerospace Behavioral Engineering Technology Committee to update an aerospace industry recommended practice on electronic symbols. Aerospace recommended practices are used by industry to demonstrate means of compliance with FAA regulations.
- Completed Human Factors Analysis and Classification System on-line database. This provides capability for FAA personnel to access key human factors information associated with NTSB accidents from 1990-2006.
- Completed research on electronic flight bag (EFB) related safety events. Results will be used to update an Advisory Circular and a new Flight Standards handbook on EFBs.

FY 2007:

- Completed development of human factors Certification Job Aid for FAR Parts 25 and 23 flight decks.
- Completed development pf the Human Factors Certification Job Aid and made it available to the aviation community through a web site application.
- Disseminated to the scientific community findings regarding simulator platform motion and its impact on pilot performance during specific maneuvers.
- Completed an international survey of human factors programs in maintenance organizations, providing information on training, error management, fatigue management, and other issues for FAA and industry.

FY 2006:

- Updated the Human Factors Certification Job Aid with Part 25 Advisory Circulars and information on design of flight deck equipment, tasks and procedures, and testing assumptions. The job aid helps government and industry to minimize the likelihood of design induced human performance errors.
- Developed practical customized assessment tools to help FAA certifiers and inspectors, system designers and operators standardize and streamline evaluations of electronic flight bags.
- Improved a Line Operations Safety Audit methodology that has been adopted by the International Civil Aviation Authority (ICAO) to help air carriers identify human-centered safety vulnerabilities.

FY 2005:

- Worked with the aviation community to produce a list of knowledge and skills that are important for pilots, instructors and evaluators who operate, teach and test in technically advanced aircraft.
- Developed a manual adopted for use by ICAO that addresses appropriate human factors considerations in designing air carrier flight deck operating documents.

- Developed and validated a proceduralized air carrier pilot Crew Resource Management training and assessment system as part of normal flight operations.

FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:
Information Management and Display

- Updated human factors guidance for electronic flight bag certification, operational approval and training based on performance data.
- Developed guidance for moving map displays in surface operations.
- Identified human factors issues in instrument procedures design.
- Developed guidance to address human factors issues associated with using synthetic vision for primary and multifunction displays.
- Developed proactive methods for general aviation data collection to facilitate risk assessment and accident prevention.

Human-Centered Automation

- Developed human factors guidance for ADS-B certification and operational approval.
- Investigated automation and new technology impacts on aviation maintenance process, safety, tasks, technician skills, and need for regulation.
- Developed advanced automation training tools for pilots reflecting results of an industry study and Performance-Based Operations Aviation Rule-Making Committee (PARC) team data.

Human Performance Assessment

- Designed a safety audit tool for maintenance and ramp operations to evaluate a maintenance organization's effectiveness.
- Identified effective methods for mitigating maintainer fatigue.
- Provided human factors guidance for the operation of unmanned aerial vehicles within the NAS.
- Continued to develop improved methods to report, record and analyze flight safety data to reduce the likelihood of air carrier incidents and accidents.

Selection and Training

- Continued development of international standards for simulator fidelity.
- Developed effective upset recovery training both for the experienced pilot and for the low-time pilot.
- Determined the appropriate training intervals to reduce pilot skill decay.

FY 2010 PROGRAM REQUEST:
The program will continue to focus on providing technical information and advice to improve pilot, inspector, maintenance technician, and aviation system performance. The emphasis will remain on developing guidelines, tools, and training to enhance error capturing and mitigation capabilities in the flight deck and maintenance environments, and on developing human factors tools to ensure that human performance considerations are adequately addressed in the design, certification, and operational approval of flight decks, equipment, and procedures. Additional emphasis will be placed on encouraging maintenance shops and repair stations to have human factors maintenance programs and to offer maintenance human factors training.

On-Going Activities

Information Management and Display

- Update human factors guidance for electronic flight bag certification, operational approval and training based on performance data.
- Develop guidance for moving map displays in surface operations.
- Identify human factors issues in instrument procedures design.

Human-Centered Automation

- Develop human factors guidance for ADS-B equipment certification and operational approval.
- Investigate automation and new technology impacts on aviation maintenance process, safety, tasks, technician skills, and need for regulation.

- Develop advanced automation training tools for pilots reflecting results of an industry study and Performance-Based Operations Aviation Rule-Making Committee (PARC) team data.

Human Performance Assessment

- Design a safety audit tool for maintenance and ramp operations to evaluate a maintenance organization's effectiveness.
- Identify effective methods for mitigating maintainer fatigue.
- Provide human factors guidance for the operation of unmanned aerial vehicles within the NAS.

Selection and Training

- Develop guidance and training material to improve consistency of safety team decisions.
- Identify training and checking approaches for jet upset recovery using advanced and existing simulators.
- Continue development of international standards for simulator fidelity.

New Initiatives

Information Management and Display

- Develop guidance to address human factors issues associated with using synthetic and enhanced vision to support equivalent visual operations.

Human-Centered Automation

- Develop human factors guidance for advanced autopilots and automation technologies in small airplanes.

Human Performance Assessment

- Develop mitigation strategies for human factors issues that are contributing to very light jet incidents.

KEY FY 2010 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Information Management and Display

- Identify human factors issues in instrument procedures design.
- Develop guidance for moving map displays in surface operations.
- Update human factors guidance for electronic flight bag certification, operational approval and training based on performance data.
- Develop guidance to address human factors issues associated with using synthetic and enhanced vision to support equivalent visual operations.

Human-Centered Automation

- Develop human factors guidance for ADS-B equipment certification and operational approval.
- Investigate automation and new technology impacts on aviation maintenance process, safety, tasks, technician skills, and need for regulation.
- Develop human factors guidance for advanced autopilots and automation technologies in small airplanes.
- Develop advanced automation training tools for pilots reflecting results of an industry study and Performance-Based Operations Aviation Rule-Making Committee (PARC) team data.

Human Performance Assessment

- Design a safety audit tool for maintenance and ramp operations to evaluate a maintenance organization's effectiveness.
- Identify effective methods for mitigating maintainer fatigue.
- Provide human factors guidance for the operation of unmanned aerial vehicles within the NAS.
- Develop mitigation strategies for human factors issues that are contributing to very light jet incidents.

Selection and Training

- Develop guidance and training material to improve consistency of safety team decisions.

- Identify training and checking approaches for jet upset recovery using advanced and existing simulators.
- Continue development of international standards for simulator fidelity.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2008)	213,063
FY 2009 Enacted	7,465
FY 2010 Request	7,128
Out-Year Planning Levels (FY 2011-2014)	29,179
Total	$256,835

Budget Authority ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Request	FY 2009 Enacted	FY 2010 Request
Contracts:					
Flightdeck/Maintenance/System Integration Human Factors	5,338	4,954	5,957	4,714	3,995
Personnel Costs	2,626	2,902	3,066	2,587	2,919
Other In-house Costs	135	143	177	164	214
Total	8,099	7,999	9,200	7,465	7,128

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Basic		0	0	0	0
Applied	8,099	7,999	9,200	7,465	7,128
Development (includes prototypes)		0	0	0	0
Total	8,099	7,999	9,200	7,465	7,128

A11.g. – Flightdeck/Maintenance/System Integration Human Factors Product and Activities	FY 2010 Request ($000)	Program Schedule					
		FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Information Management and Display	1,100						
Identify human factors issues in instrument procedures design		♦	◊	◊	◊	◊	◊
Develop guidance for moving map displays in surface operations		♦	◊	◊			
Update human factors guidance for electronic flight bag certification, operational approval and training based on performance data		♦	◊	◊			
Develop guidance to address human factors issues associated with using synthetic and enhanced vision to support equivalent visual operations			♦	◊	◊		
Human-Centered Automation	1,025						
Develop human factors guidance for ADS-B equipment certification and operational approval		♦	◊	◊	◊	◊	
Investigate automation and new technology impacts on aviation maintenance process, safety, tasks, technician skills, and need for regulation		♦	◊	◊	◊	◊	◊
Develop advanced automation training tools for pilots reflecting results of an industry study and Performance-Based Operations Aviation Rule-Making Committee (PARC) team data		♦	◊	◊			
Develop human factors guidance for advanced autopilots and automation technologies in small airplanes			♦	◊	◊		
Human Performance Assessment	970						
Design a safety audit tool for maintenance and ramp operations to evaluate a maintenance organization's effectiveness.		♦	◊	◊	◊	◊	◊
Identify effective methods for mitigating maintainer fatigue		♦	◊	◊	◊		
Provide human factors guidance for the operation of unmanned aerial vehicles within the NAS l		♦	◊	◊	◊		
Develop mitigation strategies for human factors issues that are contributing to very light jet incidents			♦	◊	◊		
Selection and Training	900						
Develop guidance and training material to improve consistency of safety team decisions		♦	◊				
Identify training and checking approaches for jet upset recovery using advanced and existing simulators		♦	◊	◊			
Continue development of international standards for simulator fidelity		♦	◊	◊			
Personnel and Other In-House Costs	3,133						
Total Budget Authority	7,128	7,465	7,128	7,208	7,264	7,323	7,384

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A11.h.	System Safety Management/Aviation Safety Risk Analysis	$12,698,000

Goals:
This program supports the following Flight Plan goal: Increased Safety.

Intended Outcomes: The System Safety Management/Aviation Safety Risk Analysis Program (formerly known as the Aviation Safety Risk Analysis Program) helps achieve FAA's strategic goal of increasing aviation safety by promoting and expanding safety information sharing and safety risk management initiatives efforts. The program develops risk management methodologies, prototype tools, technical information, and safety management system procedures and practices that will improve aviation safety. In addition, the program aims to develop an infrastructure that enables the free sharing of de-identified, aggregate safety information that is derived from various government and industry sources in a protected, aggregated manner. It also conducts research to evaluate proposed new technologies and procedures, which will improve safety by making relevant information available to the pilot during terminal operations.

Agency Outputs: The program will develop an infrastructure that enables the free sharing of de-identified, safety information that is derived from various government and industry sources in a protected, aggregated manner. In addition, the program is providing methodologies, research studies, and guidance material that provide aviation safety inspectors, aircraft certification engineers, analysts, and managers the capabilities of systematically assessing potential safety risks and applying proactive solutions to reduce aviation accidents and incidents. The program is also conducting research and analysis to maintain the desired level of safety while accommodating the need for more efficient use of the terminal area.

Research Goals: To reduce the number of aviation accidents and incidents by developing a secured safety information and analysis system that provides access to numerous databases, maintains their currency, enables interoperability across their different formats, provides the ability to identify future threats, conducts a causal analysis of those threats, and recommends solutions.

- By 2011, develop automated tools to monitor each database for potential safety issues and to analyze disparate data drawn from multiple sources, enhancing discovery, identification, and evaluation of safety risks.
- By 2012, demonstrate a working prototype of network based integration of information extracted from diverse, distributed sources.
- By 2013, develop advanced infrastructure and laboratory for conducting and sharing analysis tools and aggregated safety information that allows industry stakeholders to perform standardized data analysis and vulnerability discovery on a wide variety of diverse sets of data.
- By 2015, demonstrate a two-thirds reduction in the rate of fatalities and injuries.

To reduce the risk for passengers and crews and enhance the traffic control process in the terminal area operations, pilot-in-the-loop simulation evaluations and operational flight data analysis will be conducted.

- By 2011, characterize risks associated with undesired laser cockpit illumination, providing FAA with data to determine mitigation strategies.
- By 2011, complete an evaluation of air traffic and flight procedures for terminal area operations by using pilot-in-the-loop flight simulator.
- By 2012, develop methods to model unusual attitude encounters outside the normal operating envelope, allowing FAA to approve advanced flight simulators that more realistically model the behavior of an actual aircraft.
- By 2012, identify new navigation technologies and data requirements for the development of new procedures to enhance the capacity and safety of the terminal area.
- By 2013, identify contributing factors and develop models for landing performance of selected make, model, and series aircraft using standard operating practices to improve the safety and capacity in terminal areas.

Customer/Stakeholder Involvement: The program encourages broad industry and government participation across all projects.

- Subcommittee on Aircraft Safety of the Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review the program's activities.
- Technical Community Representative Groups – FAA representatives apply formal guidelines to ensure that the program's research projects support new rule making and the development of alternate means of compliance with existing rules.
- The Joint Planning and Development Office (JPDO) Safety Working Group – a national-level integrated safety management framework that addresses all facets of the air transportation system, building safety design assurance into operations and products.
- Commercial Aviation Safety Team – a FAA/industry collaborative effort to develop and implement data-driven safety initiatives.
- Airline industry groups to ensure that research capabilities are properly focused and benefit stakeholders beyond commercial aviation industry including, but not limited to, manufacturers of very light jets and other advanced aircraft systems.

R&D Partnerships: The Program partners with industry, academia, and other governmental agencies, including:

- National Aeronautics and Space Administration via collaborative agreements to integrate advanced research text and digital analysis products into the Aviation Safety Information and Analysis Sharing (ASIAS) research efforts.
- The Civil Aviation Authority of the Netherlands to conduct joint research on aviation system safety initiatives via a Memorandum of Cooperation.
- Technical expertise from air carriers to provide industry reviews and recommendations regarding safety and efficiency of terminal area operations as well as air carriers' cooperation with data sharing agreements and governance models that allow for the free sharing of aviation data in accordance with approved voluntary safety information sharing agreements.
- Air Transportation Association and National Air Transport Association – to assist in the development of functional and operational models.

Accomplishments: Significant accomplishments from prior years include:

Risk Management Decision Support

FY 2008:

- Defined a modified air carrier operations systems model (ACOSM) model that incorporates the regulations and relationships between Title XIV of the Code of Federal Regulations (14 CFR) Parts 121, 145, 135, 91, 191, 61, 141 and is compatible with the top level architecture of International Air Transport Association Operational Safety Audit (IOSA).
- Completed a gap analysis of FAA Safety Management System standards, FAA and international regulatory standards.
- Released a prototype decision support system that provides the FAA with improved certificate management and oversight capabilities. The major products will be identification of databases within FAA purview, redesigned databases, and possible location of and access to existing databases needed to populate the described methodology.
- Developed a technology transfer plan for the updated prototype software tool that contains the integrated framework and methodology for the identification, classification, and assessment of aviation maintenance and flight operations hazards; Added a repair station node which links to the prototype.
- Continue risk management concept, model and analytical tool development in support of commercial and general aviation.

FY 2007:

- Produced technical descriptions of the various business relationships between 14 CFR 121 operators and 14 CFR 145 repair stations; the models will be used to identify the hazards and assess the risks involved these types of relationships.
- Completed a prototype software tool that contains an integrated framework and methodology for the identification, classification, and assessment of aviation maintenance and flight operations hazards.

FY 2006:

- Released a working prototype of an integrated framework that describes the methodology for identification, classification, and assessment of aviation system hazards and risks.
- Developed a preliminary methodology which provides a baseline assessment of the current safety oversight for effectiveness, efficiency, and sustainability and identifies data inputs and could provide metrics such as the responsiveness of the air carriers to corrective and preventive actions, effects of oversight on safety precursors, inspection output and inspector workload and readiness.

Aviation Safety Information and Analysis Sharing

FY 2007:

- Released first draft of the ASIAS Concept of Operations (CONOPS) that is focused on the new data sharing concepts among commercial aviation stakeholders.

FY 2008:

- Created Governance structure and mechanisms for utilizing airline data to look at safety issues across multiple commercial aviation carriers.
- Identified studies to be completed in FY-08 related to Runway Safety and Terrain Area Warning Systems
- Identified initial set of core metrics for monitoring known risks identified through Commercial Aviation Safety Team (CAST) safety enhancements
- Identified initial set of commercial airline industry benchmarks that allow airlines to understand how their operations are performing in comparison to other airlines participating in the ASIAS program
- Completed initial acquisition of new types of data for analyzing safety issues around the airport and runway.

Aircraft Maintenance - Maintainability and Reliability

FY 2007:

- Proposed a new quality management system to perform and monitor tool calibration at maintenance facilities; the new system will improve safety by reducing aircraft maintenance errors due to the use of out-of-tolerance tools.

FY 2005:

- Completed enhancements to the Maintenance Malfunction Information Reporting (MMIR) System with capability to collect usage and flight profile data – the helicopter industry and FAA are using the MMIR data to improve maintenance reliability and product design.

FY 2004:

- Provided technical data and recommendations for designing an effective repair station training program, including the recommended number of hours and topics for training mechanics, managers, supervisors, and inspectors. The FAA issued AC 145-10 “Repair Station Training Program” in July 2005.

Safety Analysis Methodology

FY 2007:

- Completed a methodology to provide a different level of certification credit for design features intended to reduce flight crew errors.

FY 2005:

- Provided technical data on standard probabilities of certain environmental and operational conditions to support transport airplane certification for safety assessment purposes.

Terminal Area Safety

FY2008:

- Completed the evaluation of stopping distances for two typical subsonic narrow body jet aircraft in commercial operations. The data will aid in understanding causes of aircraft overruns.
- Conducted a survey of area navigation (RNAV) and flight management systems to determine the current and projected capabilities with regard to radius-to-fix (RF) path terminators.
- Conducted bench test of currently RF-capable RNAV and flight management systems against a representative group of terminal and instrument approach procedures to evaluate capabilities and constraints for RF path terminators.

FY 2007:

- Completed flight evaluation of the critical terminal area situations under which red Land and Hold Short Operations lights must be illuminated and extinguished during high capacity operations at an airport by using pilot-in-the-loop flight simulation.
- Developed assessment tools and procedures to evaluate pilot workload during various flight conditions by using the LifeShirt® technology in simulated flight operations.

FY 2006:

- Developed methods to identify commercial aircraft touchdown points during commercial operations by using instrument landing systems (ILS) or non-ILS information, these methods will aid in understanding causes of aircraft overruns and runway excursions.

FY 2005:

- Provided measures of pilot reaction to laser illumination collected using FAA's B-737 flight simulator to support AC 70-1 "Outdoor Laser Operations" and AC 70-2 "Reporting of Laser Illumination of Aircraft".

FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Aviation Safety Information and Analysis Sharing

- Completed the ASIAS CONOPS that is focused on the new data sharing concepts among commercial aviation stakeholders.
- Developed an ASIAS architecture for the implementation of emerging technologies and system to support the sharing of information between commercial aviation stakeholders.
- Developed automated tools to monitor databases for potential safety issues.
- Developed prototype ASIAS system and associated reports that show the benefit of using diverse textual and digital data sets for analyzing commercial aviation safety metrics and enhancements.
- Conducted analytical studies, e.g. aircraft hazard analysis, determination of risk values for potential unsafe conditions, and flight crew intervention design credit, using ASIAS and other aviation safety data.
- Developed methods and risk models to evaluate advanced aircraft systems and component integration.

Risk Management Decision Support

- Completed a model which identifies and incorporates the gap analysis between 14 CFR Parts 121, 135, 145; maps to the two top levels of ACOSM, and can be interfaced with IOSA.
- Determined injury ratios for well-defined unsafe conditions (e.g., structure failure, electrical system failure, landing gear vibration, powerplant failure, and so forth) on aircraft systems or components.

Aircraft Maintenance - Maintainability and Reliability

- Completed technical data for the purpose of preparing standards for carbon monoxide detection devices and inspection methods to determine the integrity of exhaust systems.

Terminal Area Safety

- Developed testing procedures and requirements to identify required navigational performance (RNP) constraints related to terminal area operations.
- Evaluated air traffic and flight procedures for terminal area operations by using the human-in-the-loop flight and air traffic simulators.
- Evaluated devices and risks associated with undesired laser cockpit illumination.
- Analyzed operational landing distance performance of selected aircraft make/model/series.

FY 2010 PROGRAM REQUEST:

Ongoing Activities

Government, industry, and academia aviation safety subject matter experts will be invited to demonstrate a working prototype of a network-based integration of information extracted from diverse, distributed sources. The research will continue to develop innovative, advanced tools and methodologies that will for the first time be able to convert and integrate aviation safety data that is currently distributed across multiple organizations and archives into information on the operational performance and safety of the aviation system. Using ASIAS and other aviation safety data, analytical studies to identify safety issues and verify mitigation and safety enhancements will continue. Research and analysis will continue to ensure that the FAA maintains a desired level of safety while accommodating the need for more efficient use of the terminal area.

New Initiatives

Safety Impact Assessment of Very Light jets (VLJs). There is a need to assess the risk and impact of VLJs on the NAS. Introduction of VLJs will require the development of separation standards as required between fast moving 14 CFR Part 121 and slower moving VLJs, the design of separate highway-in-the-sky of tubes for VLJs, VLJ flight track distribution and the development or modification of obstruction clearance surface (OCS) for VLJ.

KEY FY 2010 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Aviation Safety information Analysis and Sharing (ASIAS)

- Expand ASIAS architecture to include the sharing of air traffic information and air carrier information among industry stakeholders.
- Continue development of automated tools to monitor databases for potential safety issues.
- Expand prototype system to include the concepts of sharing information and applications among industry stakeholders from an enterprise-level, allowing diverse industry stakeholders to analyze data on an industry-wide basis rather than individual organizational level. The prototype system will contain a technical process to query de-identified safety data from any participating airline Flight Operations Quality Assurance or Aviation Safety Action Program, aggregate it through a distributed database and make it accessible to appropriate industry stakeholders. The ASIAS prototype will be demonstrated in 2012.
- Conduct analytical studies, e.g., aircraft hazard analysis, determination of risk values for potential unsafe conditions, and flight crew intervention design credit, using ASIAS and other aviation safety data.

- Develop methods and risk models to evaluate advanced aircraft systems and component integration.

Risk Management Decision Support

- Initiate development of a method and associated metrics to measure progress in reducing the rate of fatalities and significant injuries.
- Develop at least one methodology for the mid-air collision risk analysis between VLJ and 14 CFR Part 121 aircraft and develop one prototype tool to assess the risk.
- Complete injury ratios for well-defined unsafe conditions (e.g., structure failure, electrical system failure, landing gear vibration, powerplant failure, and so forth) on aircraft systems or components.
- Continue risk management concept, model and analytical tool development in support of commercial and general aviation.

Terminal Area Safety

- Complete testing procedures and requirements to identify RNP constraints related to terminal area operations.
- Continue evaluating devices and risks associated with undesired laser cockpit illumination.
- Evaluate air traffic and flight procedures for terminal area operations by using the pilot-in-the-loop flight simulator.
- Analyze the operational landing distance performance of selected aircraft make/model/series.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2008)	78,915
FY 2009 Enacted	12,488
FY 2010 Request	12,698
Out-Year Planning Levels (FY 2011-2014)	50,044
Total	$154,145

Budget Authority ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Contracts:					
System Safety Management	3,303	3,232	6,402	9,608	9,879
Personnel Costs	1,494	1,947	2,892	2,669	2,531
Other In-house Costs	86	113	223	211	288
Total	4,883	5,292	9,517	12,488	12,698

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Basic	0	0	0	0	0
Applied	4,883	5,292	9,517	12,488	12,698
Development (includes prototypes)	0	0	0	0	0
Total	4,883	5,292	9,517	12,488	12,698

A11.h. - System Safety Management/ Aviation Safety Risk Analysis Product and Activities	FY 2010 Request ($000)	Program Schedule					
		FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
060-110 Aviation Safety Risk Analysis							
Risk Management Decision Support	526						
• Develop method and associated metrics to measure progress in reducing the rate of fatalities and • significant injuries		♦	◊	◊	◊	◊	◊
• Continue risk management concept, model and analytical tool development in support of commercial and general aviation.		♦	◊	◊	◊		
• Completed a model which identifies and incorporates the gap analysis between 14 CFR Parts 121, 135, 145; maps to the two top levels of ACOSM, and can be interfaced with IOSA.		♦					
Conduct System Safety Assessment of VLJs			◊	◊	◊		
Aviation Safety Information Analysis and Sharing	7,658						
Complete ASIAS Concept of Operations (CONOPS) focused on the new data sharing concepts among commercial aviation		♦					
Develop an architecture for ASIAS		♦	◊				
Develop automated tools to monitor databases for potential safety issues		♦	◊	◊	◊	◊	
Develop prototype ASIAS system and associated reports		♦	◊	◊	◊		
Conduct analytical studies using ASIAS and other aviation safety data		♦	◊	◊	◊	◊	◊
Develop methods and risk models to evaluate advanced aircraft systems and component integration.		♦	◊	◊	◊		
Aircraft Maintenance – Maintainability & Reliability	0						
Develop standards for carbon monoxide detection devices and inspection methods to determine the integrity of exhaust systems		♦					
Terminal Area Safety	1,695						
Develop testing procedures and requirements to identify RNP constraints		♦	◊	◊	◊	◊	◊
Evaluate air traffic and flight procedures for terminal area operations by using human-in-the-loop flight and air traffic simulator		♦	◊	◊	◊		
Evaluate devices and risks associated with undesired laser cockpit illumination		♦	◊	◊	◊		
Identify contributing factors and develop models for landing performance of selected make/model/series aircraft using standard operating practices to improve the safety and		♦	◊	◊	◊	◊	◊
Personnel and Other In-House Costs	2,819						
Total Budget Authority	12,698	12,4[illegible]	12,698	12,668	12,566	12,460	12,350

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Request
A11.i.	Air Traffic Control/Technical Operations Human Factors	$10,302,000

GOALS:
This program supports the following Flight Plan goals: Increased Safety, Greater Capacity, and Organizational Excellence.

Intended Outcomes: The Air Traffic Control/Technical Operations (ATC/TO) Human Factors Program supports FAA strategic goals for increased safety, greater capacity, and organizational excellence by developing research products and promoting the use of those products to meet the future demands of the aviation system. This human factors research program for FY 2010 will emphasize the safety aspects of the functions performed by air traffic controllers and technical operations personnel. The program will examine the roles of controllers and maintainers at increased capacity levels and how those roles are best supported by allocation of functions between human operators and automation to enhance safety and minimize the potential for human error. The ATC/TO program generates requirements for human interface characteristics of future air traffic and technical operations (maintainer) workstations. It is enhancing our understanding of the role that system design plays in mitigating human error including operational errors, runway incursions, and errors that result in NAS equipment outages. In addition, researchers are developing effective methods to present weather information to air traffic specialists for severe weather avoidance and accident prevention, developing methods to select new air traffic service providers and maintainers so that the applicant screening process is valid, reliable, and fair, and improving human-system integration in the maintenance arena to increase reliability and availability of the NAS.

The research program works to improve system safety by:

- Developing:
  - A technical operations Human-System Integration roadmap that complements the introduction of advanced technology and automated capabilities as the NAS increases dependence on automation and leased services for critical data sources in the NAS that were formerly controlled by the FAA.
  - Methods to identify new potential human error problems as the air traffic service providers' roles and responsibilities change as a result of increasing automation levels.
  - Organizational changes to transform the technical operations Air Traffic Organization (ATO) safety culture.
  - Effective methods to present air traffic specialists weather information for accident prevention through severe weather avoidance.
- Improving:
  - Effectiveness of safety analyses that concentrate on detecting the potential for human error during the concept and research phases of system development.
  - Methods to select and train new air traffic service providers and maintainers.

The program works to improve the ATC and technical operations contribution to system capacity by:

- Developing:
  - Integrated workstations that allow air traffic service providers to meet increased service demand.
  - Methods to assess the value of proposed changes to workstations to determine if human-in-the-loop performance is enhanced.
  - Advanced workstation concepts for maintenance workstations that use automation and advanced technology to increase availability of the NAS, decrease the probability of system outages, and decrease the cost of air traffic services.

- Improving:
  - Human-system integration in a manner that allows air traffic service providers and pilots to cooperatively manage traffic loads as cockpit technology and air traffic workstations are more closely connected to efficiently move NAS air traffic.
  - Roles and responsibilities between air traffic service providers and pilots as technology evolves to meet future demands.

Agency Outputs: The Air Traffic Control/Technical Operations Human Factors Research Program provides leadership and products to motivate NAS evolution to assure that the system's human component will reliably perform to meet the flying public's needs. Outputs include:

- Air traffic workstations and concepts that increase workforce productivity by identifying key workload factors that must be mitigated to enable the humans in the system to manage the future NAS traffic flow.
- Candidate technology evaluations that purport to provide a specified human-in-the-loop performance level or safety benefit when used by the ATO workforce.
- ATO safety culture transformation through research in the Technical Operations community to identify effective interventions to move the ATO toward a "Just Culture."
- Future air traffic service provider and maintainer personnel selection criteria to enhance screening process efficiency and effectiveness.

Research Goals:

- By FY 2010, complete a study to determine the role of time on position as it impacts the potential for an operational error.
- By FY 2010, identify the changes to the ATO technical operations safety culture that resulted from previous research initiatives as they transition to the operational domain.
- By FY 2012, improve computer-human interface design to reduce information overload and resulting errors.
- By FY 2012, apply program-generated human factors knowledge to improve aviation system personnel selection and training.

Customer/Stakeholder Involvement: The ATC/ATO Human Factors research program receives requirements from its internal FAA sponsoring organizations, primarily the following FAA ATO Air Traffic/Technical Operations research groups:

- Advanced Air Traffic Systems Requirements Group – En Route and Terminal Service units as well as System Engineering in Operations Planning operational personnel and systems developers articulate human factors research requirements for measuring the proposed technology benefits to controllers and maintainers. FAA Flight Standards and Aircraft Certification organizations participate in the research requirements definition associated with pilot/controller interface with air-ground integration weather aspects as the FAA moves toward a vision of the future NAS.
- Individual and Team Performance Requirements Group – ATO Safety, En Route, Terminal, Technical Operations and System Engineering service units participate to identify human performance research needs involving fatigue, safety culture, human error hazard identification, age, operational errors, runway incursion prevention, and employee attitudes.
- Advanced Technical Operations Systems Requirements Group – The Technical Operations, En Route, and Terminal service units recommend NAS infrastructure operational and maintenance research including ATC systems displays, controls, and maintainability features specification.
- Personnel Selection and Training Requirements Group – ATO Technical Training and Development, Human Resources, FAA Academy, Workforce Services, and the Financial Services groups address personnel selection and training including the ability to successfully screen applicants for controller positions and for reduced training cost and time.

R&D Partnerships:

- Collaborative research with NASA includes identifying future NAS human factors air-ground integration research issues as technology brings changes to flight deck capabilities.
- Collaboration with EUROCONTROL includes participation in semi-annual Air Traffic Management (ATM) Seminars, leadership of an Action Plan 15 Safety workgroup for human reliability, and ATM Safety Research symposia participation.
- Program personnel represent the agency in the Normal Operations Safety Survey (NOSS) Study Group of International Civil Aviation Organization (ICAO).
- The University of Texas has performed NOSS research at ATM facilities in New Zealand, Australia, Canada, and Finland with ICAO endorsement.
- Cooperative research agreements are in place with Massachusetts Institute of Technology, St. Louis University, Ohio State University, and American Institutes for Research.

Accomplishments: Program highlights include:

FY 2008:

- Completed tower simulation infrastructure to support NextGen human factors research for the airport domain.
- Application of en route workstation research concepts that are being transferred to the operational arena as the data communications program matures through the initial integration of this technology.
- Completion and dissemination of a tower supervisor best practices study to suppress the potential for runway incursions and operational errors.
- Validated the Human Error Safety Risk Assessment (HESRA) research tool on a wake turbulence system in the early stages of development to manage safety risk prior to system development and fielding. This research tool will be transferred to the operational domain via the Safety Management System (SMS) toolbox.
- Completed first stage of safety culture enhancement by transfer of the technical operations aviation safety action program (ASAP) to the operational domain.
- Completed data collection for the technical operations work force anthropometric measurement database.
- Developed a maintenance domain alerts and alarms human factors design standard.
- Conducted a NOSS trial in a FAA facility to demonstrate the utility of the concept and provide unique safety data for the participating facility.
- Initiated a maintainable and extensible job/task analysis information database providing the ability to access, update, and report requirements in parallel with NextGen development.
- Developed and validated a technically sound computer-based practical color vision test that relates to ATC tasks.

FY 2007:

- Completed simulations that evaluate capacity enhancements when en route workstations are provided with data communications and aircraft self-spacing and self-separation provisions.
- ATC safety alerts study completion in response to National Transportation Safety Board concerns that controllers are not responding properly to prevent mid-air collisions and controlled flight into terrain accidents.
- Tower situation display demonstration with integrated flight data to reduce display clutter and integrate tower controller tasks.
- Initiation of a tower controller external vision requirements study to support staffed virtual tower development with no direct airport surface view.
- Safety Culture improvement project expansion to more facilities enabling the technical operations community to improve safety
- Transfer of the National Air Traffic Professionalism Program (NATPRO) to the En Route service unit as a research product that is making the transition to the operational domain.

- Updated en route and terminal job task analyses and developed air traffic controller performance standards.

FY 2006:

- Explored human performance limitations to find controller workload limits using current technology and procedures as traffic levels increase.
- Completed an initial effort to transform the ATO work force safety culture.
- Initiated data collection to update the anthropometric database to guide maintenance workstation ergonomic design.
- Initiated development of a pre-screening alternative form for air traffic controller job applicants that are selected to take the Air Traffic Selection and Training (AT-SAT) test battery.
- Initiated a tower controller duties and functions task analysis to enhance the terminal training option method of selecting candidates.

FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Initiated second stage of transforming the safety culture of the Technical Operations organization and assess intervention effectiveness of first stage efforts.
- Delivered initial results of a study of time-on-position as a predictor of the potential for operational errors due to lack of initial situation awareness when beginning a shift or relieving another controller.
- Estimated the safety risk of an operational error (OE) occurring based on the exposure to daily activities while working on a given shift at a particular time of day and time on position to use in establishing safety priorities.
- Continued methodology validation to assign controller applicants to tower versus radar training.
- Continue assessment of new NextGen systems and procedures impact on selection and training for future air traffic service providers and maintainers.
- Transferred interim color vision test for air traffic controller evaluation to the operational domain.
- Completed the validity assessment of the Credentialing Skills Evaluation process for air traffic controller compliance with ICAO credential requirements.
- Completed data collection for TRACON supervisor best practices to identify an exportable package of materials that can be used to suppress operational errors in the terminal domain.

FY 2010 PROGRAM REQUEST

The program will continue to provide research that will operate in concert with other human factors system development activities that are focused on the NextGen solutions being proposed for the future NAS. This research program addresses human performance issues in ATC systems acquisition, design, operation, and maintenance over the next several years with an emphasis on safety and personnel. The human factors research program will continue to emphasize the safety aspects of NAS enhancements as NextGen changes emerge and change the interactions between the actors and systems in the NAS. The proactive analysis of human error causal factors continues to be the focus of a portion of this research program.

Advanced Air Traffic Systems

- Developing human factors display requirements for weather information to mitigate the hazards to flight presented by icing, low ceiling and visibility, and convective activity with the objective of accident prevention.
- Developing a human factors display standard for air traffic control displays.

Individual and Team Performance

- Develop a model of controller time-on-position to predict the probability of operational errors for various rotation cycle lengths for position relief to determine the range of optimum times that reduce the probability of error.

- Continue work in human error reduction and reporting by expanding the application of research in transformation of the ATO safety culture.

Advanced Technical Operations Systems

- Assess the impact of preventive maintenance on unscheduled outages. Determine the causes of human error during scheduled maintenance that results in premature NAS system failure.
- Design and develop the maintenance workstation for the future NAS to reduce staffing and skill level requirements and enhance availability of the NAS.

Personnel Selection and Training

- Develop a technical operations road map to utilize human-system integration concepts as a method to assure that as new technology is developed and fielded in the NAS the human component of the system is planned on a plane equal to that of technology to assure that personnel staffing, skills, and training are adequate to meet future needs.
- Initiate strategic training analysis to support the conceptual development of NextGen procedures and systems.
- Transform the critical performance requirements of the NAS maintainer job and required skills into selection and training criteria for the future work force.

New Initiatives

New initiatives will focus on the maintenance aspects of the ATC system. The NAS architecture plan, the NextGen Implementation Plan (NGIP) and the JPDO concept of operations introduce many automation concepts that will require an updated maintenance concept including increased availability of NAS systems, a maintainer personnel roadmap and a concerted effort to reduce the effects of human error during the maintenance process:

- Develop a human-system integration road map for the technical operations work force in a strategic view.
- Develop new methods to proactively identify the potential for human error to interrupt NAS operations as increased levels of automation amplify the consequences of system outages
- Develop new workstations that allow faster recovery from NAS system failures

KEY FY 2010 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Advanced Air Traffic Systems

- Develop a human factors display standard that will be used as a system design requirements document to leverage past lessons learned and aid the move toward a common display platform for all air traffic domains where similar display requirements exist.
- Deliver guidelines and requirements for weather information displays for controllers that will aid in further reduction of the aviation accident and fatality rate.

Individual and Team Performance

- Conduct simulations and analyses of controller time-on-position as it relates to operational errors. The analyses will seek to find the minimum time on position that provides an adequate level of situation awareness and the maximum time beyond which mental fatigue induces human error.
- Refine a tool for human reliability analysis in collaboration with EUROCONTROL human factors experts to assess the impact of changes to air traffic management planned by both the US and European air traffic service providers.
- Conduct a survey to determine the effectiveness of controller fatigue management changes introduced in FAA Orders during 2009

Advanced Technical Operations (TO) Systems

- Deliver an analysis of the impact of human error on availability of the NAS.
- Continue a Human System Integration Study of the impact future air traffic maintenance concepts on the Technical Operations workforce.

Personnel Selection and Training

- Deliver an initial Technical Operations Human-System Integration Roadmap to complement the NAS Enterprise Architecture.
- Perform a strategic training analysis to support the conceptual development of NextGen procedures and systems for controllers and maintainers
- Prepare a set of required skills and NAS maintainer performance requirements suitable for transformation into selection and training requirements for the future NAS.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2008)	172,105
FY 2009 Enacted	10,469
FY 2010 Request	10,302
Out-Year Planning Levels (FY 2011-2014)	43,142
Total	$236,018

Budget Authority ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Contracts:					
Air Traffic Control/Technical Operations	4,234	4,130	4,333	4,042	4,389
Personnel Costs	5,079	5,285	5,443	6,128	5,617
Other In-house Costs	245	239	224	299	296
Total	9,558	9,654	10,000	10,469	10,302

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Request	FY 2009 Enacted	FY 2010 Request
Basic	0	0	0	0	0
Applied	9,558	9,654	10,000	10,469	10,302
Development (includes prototypes)	0	0	0	0	0
Total	9,558	9,654	10,000	10,469	10,302

A11.i. – Air Traffic Control/Technical Operations Human Factors Product and Activities	FY 2010 Request ($000)	Program Schedule					
		FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
082-110 Air Traffic Control/Technical Operations Human Factors							
Advanced Air Traffic Systems	450						
Develop human factors display standard for common display platform		♦	◊	◊			
Deliver guidelines and requirement for improved weather products for controllers		♦	◊	◊	◊		
Individual and Team Performance	1,469						
Conduct simulations and analyses of controller time-on-position			◊	◊	◊	◊	
Refine Human Reliability Analysis tool		♦	◊				
Conduct a controller fatigue management survey			◊	◊			
Transform the technical operations work force safety culture		♦	◊	◊	◊		
Technical Operations (TO)	1,381						
Deliver analysis of human error impact on NAS availability		♦	◊	◊	◊		
Conduct HSI study of maintenance CONOPS			◊	◊			
			◊	◊	◊	◊	
Personnel Selection and Training	1,089						
Deliver an initial TO Personnel Road Map		♦	◊	◊	◊		
Perform strategic training analysis for systems and procedures		♦	◊	◊	◊		
Prepare required skills and performance requirements		♦	◊	◊	◊	◊	◊
Personnel and Other In-House Costs	5,913						
Total Budget Authority	10,302	10,469	10,302	10,505	10,686	10,876	11,075

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A11.j.	Aeromedical Research	$10,378,000

GOALS:
This program supports the following Flight Plan goal: Increased Safety.

Intended Outcomes:

Civil Aerospace Medical Institute (CAMI) Aeromedical Research Program

The Aeromedical Research Program supports FAA's Flight Plan Goal for Increased Safety by:

- Investigating and analyzing injury and death patterns in civilian flight accidents and incidents to determine their cause and develop preventive strategies.
- Supporting FAA regulatory and medical certification processes that develop safety and health regulations covering all aerospace craft occupants and their flight environments.
- Recommending and developing equipment, technology, and procedures for optimal:
    - Evacuation and egress of humans from aerospace craft;
    - Dynamic protection and safety of humans on aerospace craft; and
    - Safety, security, and health of humans on aerospace craft.

Research program outcomes include improved safety, security, protection, survivability and health of aerospace craft passengers and aircrews. The Aeromedical Research Program supports FAA's Flight Plan goals to reduce air carrier fatalities, reduce the number of fatal accidents in general aviation and support FAA organizational excellence by:

- Exploiting new and evaluating existing bioaeronautical guidelines, standards, and models for aerospace craft cabin equipment, procedures, and environments.
- Providing research data to serve as the basis for new regulatory action in evaluation of existing regulations to continuously optimize human performance, health, and safety at a minimum cost to the aviation industry.
- Analyzing pilot medical and flight data, information from accidents and incidents, and advanced biomedical research results to propose standards and assess certification procedures that optimize performance capability.
- Evaluating the complex mix of pilot, flight attendant and passenger activities in a wide range of environmental, behavioral, and physiological situations to propose standards and guidelines that will enhance the health, safety, and security of all aerospace travelers.

Airliner Cabin Environment Research Program

The Airliner Cabin Environment Research Program supports FAA's Flight Plan Goal for Increased Safety by:

- Developing and testing adaptive environmental control techniques to enable a safe and healthy cabin air environment including during in-flight incidents.
- Validating software tools and methods to mitigate air contamination incidents during flight and ground operations.
- Developing of advanced air chemistry models for interaction of atmospheric ozone and volatile organic compounds.
- Developing advanced methods to automatically analyze textual safety reports and extract system performance information for prognostic identification of safety risks for system operators and designers.
- Developing advanced scientific models and experimental data of airborne and surface transmission of existing and emerging infectious diseases within aircraft.
- Evidence-based development of appropriate hazard identification and risk management criteria guidelines to maximize safety and health in the air transportation system in response to infectious disease.
- Recommending and developing equipment, technology, and procedures for optimal:

- Evidence-based development of appropriate policy, regulations and guidelines to maximize safety and health from the cabin air quality environment;
- Identifying hazards and characterizing risks of the major infectious diseases likely to be carried on-board aircraft;
- Providing air quality incident identification to alert crew to potential problems and provide signals to the environmental control system for appropriate response; and
- Providing for safety, security and health of passengers and crewmembers on commercial aircraft.

Agency Outputs: Agency outputs proceed from the FAA Office of Aviation Medicine (AAM), specifically, 1) the Civil Aerospace Medical Institute (CAMI) and 2) the FAA National Air Transportation Center of Excellence (CoE) for Research in the Intermodal Transportation Environment (RITE).

CAMI Aeromedical Research Program

CAMI's Aeromedical Research Program provides research data to assess new technology, and evaluate existing bioaeronautical guidelines, standards, and models for aerospace craft cabin equipment, procedures, and environments. Aeromedical research serves as the basis for new regulatory action and evaluation of existing regulations to continuously optimize human performance and safety at a minimum cost to the aviation industry. This research program analyzes pilot medical and flight data, information from accidents and incidents, and advanced biomedical research results to propose standards and assess certification procedures that optimize performance capability. This research program is conducted by in-house resources, specifically the CAMI Aerospace Medical Research Division and supports Airliner Cabin Environment Research efforts.

Airliner Cabin Environment Research Program

The FAA National Air Transportation Center of Excellence (CoE) for Research in the Intermodal Transportation Environment (RITE) was formulated in response to issues raised in a 2002 National Research Council Report regarding Airliner Cabin Environment and the Health of Passengers and Crew during normal and events outside the normal operational envelope. It addresses public, aircrew, and congressional concerns regarding these issues including disease transmission, contaminant transport, and ozone that include chemical reactivity research of aircraft cabin interiors and contaminants that may be carcinogenic. Pesticides, both residual and spraying, are chemicals similar to phosphate esters used as additives in hydraulic and lubricating fluids in aircraft engines and Auxiliary Power Units (APUs) and identified as possible neurological toxins in crew members. RITE is primarily conducted by universities and the industry. Established in 2004 by the FAA Administrator RITE is led by Auburn University, with Harvard and Purdue Universities as Technical Co-Leads. Other member universities include Boise State University, Kansas State University, the University of California at Berkeley, and the University of Medicine and Dentistry of New Jersey. RITE conducts R&D on cabin air quality and on chemical and biological agents, decontamination, and materials compatibility for aircraft.

The FAA and RITE are uniquely positioned to provide evidence based research data to assess new technologies, provide hazard identification and risk assessment for aircraft cabin environmental events and provide appropriate guidelines, propose standards, and models for aircraft cabin equipment, procedures, and environments. The airliner cabin environment research program serves as the basis for new regulatory action and evaluation of existing regulations to continuously optimize the safety and health of passengers and crewmembers at a minimum cost to the aviation industry.

Research Goals:

CAMI Aeromedical Research Program

- By 2012, validate mathematical models to evaluate whether aircraft designs meet requirements for evacuation and emergency response capability.
- By 2012, establish design criteria for restraint systems that protect occupants at the highest impact levels that the aircraft structure can sustain.
- By 2015, apply and develop advances in gene expression, toxicology, and bioinformatics technology and methods to define human response to aerospace stressors.

- By 2015, incorporate aerospace medical issues in the development of safety strategies concerning upset recovery, controlled flight into terrain (CFIT), and other forms of loss of aircraft control: As adaptive-control techniques are developed, assess pilot performance relative to aeromedical considerations.
- By 2015, develop advanced methods to extract aeromedical information for prognostic identification of human safety risks.
- By 2015, develop a methodology to compile, classify, and assess aviation-related injuries, the mechanisms that resulted in these injuries, and their relationship to: autopsy findings, medical certification data, aircraft cabin configurations, and biodynamic testing: Aerospace Accident Injury and Autopsy Data System (AAIADS)

Airliner Cabin Environment Research Program

- By 2010, develop and analyze methods to detect and analyze aircraft cabin contamination including chemical-biological hazards and other airborne irritants.
- By 2010, validate computational models of chemical air contaminants, such as volatile organic compounds, to evaluate health and safety impacts on passengers and crew.
- By 2011, apply and validate advanced air sensing technology for volatile organic compounds in the aircraft cabin environment.
- By 2011, develop bleed air contamination models of engine compressors and high temperature air system for effects on health and safety of passengers and crew.
- By 2012, complete experimental projects in support of regulatory, certification, and operations for existing Aviation Rulemaking Committees by providing data and guidance for new or revised regulation of airliner cabin environment standards.
- By 2012, develop and validate chemical kinetic models for bleed air systems for health and safety effects on passengers and crew.

Customer/Stakeholder Involvement:

CAMI Aeromedical Research Program

- Directly supports the bioaeronautics agenda set forth in the Executive Office of the President, National Science and Technology Council, National Plan for Aeronautics Research and Development and Related Infrastructure (NPARDRI), released 1/10/2008.
- Directly supports the bioaeronautics agenda set forth in the Executive Office of the President, Office of Management and Budget (OMB) and Office of Science & Technology Policy (OST) FY 2009 Administration R&D Budget Priorities, 8/14/2007 (EOP).
- Provides research for FAA, European Aviation Safety Authority and Transport Canada under the Aircraft Cabin Safety Research Plan. This is a coordinated, living plan to maximize the cost/benefit of aerospace craft cabin safety research nationally and internationally.
- Supports multi-year collaborative studies by FAA and other government and industrial entities to evaluate flight crew and passenger symptomatology, disease, and impairment.
- Supports the NextGen Implementation Plan, Smart Sheets, Solution Set Increased Safety, Security and Environmental Performance, Safety Management Systems.

Airliner Cabin Environment Research Program

- The Airliner Cabin Environment Research Program directly supports the FAA's Statutory Authority, 49 USC 40101D, 44701A, 40 FR 29114 DOT, 49 CFR 830.5, Public Law 106-81, 14 CFR 1.1, 21, 25, 121, 125, and 135 to protect the health and safety of passengers and crewmembers.
- The Executive Office of the President, National Science and Technology Council, National Plan for Aeronautics Research and Development and Related Infrastructure.
- The Executive Office of the President, OMB and OST FY 2009 Administration R&D Budget Priorities.
- White House Implementation Plan for National Strategy for Pandemic Influenza.
- World Heath Organization International Health Regulations agreed to by the Secretary, Department of Transportation

- Supports multi-year collaborative studies by FAA, other government agencies, and industrial entities to evaluate airliner cabin environment to protect the safety and health of passengers and crewmembers.
- Supports the Wendell H. Ford Aviation Investment and Reform Act of the 21 Century section 725; Public Law 106-181.
- Supports the FAA National Air Transportation Center of Excellence for Research in the Intermodal Transport Environment
- Supports the White House Implementation Plan for National Strategy for Pandemic Influenza.
- Provides collaborative research with the Civil Aviation Authority-United Kingdom on cabin air quality.
- Supports the Health and Human Services Implementation Plan to characterize viral subtypes and enable detection and investigation of suspected cases and detect increase in disease activity in the aircraft cabin environment.

R&D Partnerships:

CAMI Aeromedical Research Program

- Direct collaboration with the DoD, NASA, and NTSB on accident investigation, crashworthiness, in-flight turbulence, aerospace medicine, ocular injury from lasers, and exposure to cosmic radiation.
- Develops Cooperative Research and Development Agreements (CRDA) and Memorandums of Understanding/Agreement (MOA/U) with industry to ensure collaborative projects benefiting both FAA and the aviation industry.
- Participates in North Atlantic Treaty Organization (NATO) aerospace medical advisory groups, the European Union, and many academic institutions and government laboratories.
- Established National Research Council (NRC) postdoctoral programs to conduct research in molecular biology, bioinformatics, environmental physiology, and other aviation medicine fields at CAMI.
- Established a professional relationship with over 90 organizations and 55 committees including holding fellowships and other leadership positions. These scientific, medical, and bioengineering relationships include working in partnership on a multitude of efforts with these organizations including the following:
  - Cabin Safety Harmonization Working Group
  - Seat Certification Streamlining Effort
  - The National Safety Council
  - Society of Automotive Engineers
  - Aerospace Medical Association
  - Civil Aviation Medical Association
  - American Society of Mechanical Engineers
  - American Ophthalmological Society
  - Society of Forensic Toxicologists
  - American Academy of Forensic Science

Airliner Cabin Environment Research Program

RITE has over 30 industry partners participating in the research and development effort. Office of Aerospace Medicine staff members collaborate with leadership positions in the following associated with aerospace medicine, aviation health, airliner cabin environment and safety:

- Direct coordination and collaboration with the DoD
- Direct coordination and collaboration with Department of Homeland Security, Transportation Security Administration
- Environment Protection Agency
- Health and Human Services
- Centers for Disease Control and Protection
- National Institute for Occupational Health and Safety
- International Civil Aviation Organization.

- International Aviation Transportation Association
- Air Transport Association
- Boeing
- Delta
- Honeywell
- American Society of Heating, Refrigerating and Air-Conditioning Engineers
- American Society for Testing and Materials International
- Memorandum of Cooperation with the Civil Aviation Authority-United Kingdom to collaborate and coordinate airliner cabin environment research in sampling and analyzing air quality in aircraft cabins.
- Develops cooperative research and development agreements with industry to ensure collaborative projects benefiting both FAA and the aviation industry.
- Participates and coordinates airliner cabin environment research with Air Transportation Association Medical Committee and Cabin Technical Operations Committee.

Accomplishments:

FY 2008

CAMI Aeromedical Research Program

Aeromedical Safety Management System

- The aerospace Medical Research Scientific Information System (SIS) software was documented for use by aeromedical research scientists.
- Completed phase I of a cross functional study of diabetes in civil aviation.
- Continued the development of an Aerospace Accident Injury and Autopsy Data System (AAIADS) – realized significant coordination & collaborative activities.
- Accepted FAA Accident Autopsy Program responsibilities.
- Completed the program on quality control and assurance concerning the use of the CAMI Data Imaging and Workflow System (DIWS).
- Completed the Quality Control and Assurance Software Tool (computer code) to facilitate risk management processes in medical certification of aircrew.
- Examined the frequency and rate of aviation-related laser incidents by year and location.
- Evaluated All-Strobe Approach Lighting Systems.
- Evaluated new design Optometric Test Devices.
- Provided recommendations regarding Infrared Radiation Transmittance and Pilot Vision Through Civilian Aircraft Windscreens
- Provided Safety Considerations for High-Intensity Lights Projected into the Navigable Space: SAE G10-T Working Group: Aerospace Recommended Practice (ARP) document.
- Assessed the Medical Certification Of Civilian Pilots Fitted With Multifocal Contact Lenses and those Considering Laser Eye Surgery.
- Assessed Aircraft accidents and incidents associated with visual effects from bright light exposures during low-light flight operation
- Assessed Laser Exposure Incidents: Pilots Ocular Health And Aviation Safety Issues.

Accident Prevention and Investigation

- Compared usage of both illegal drugs and abused prescription medications in pilots involved in civil aviation accidents with that of the general population in the United States.
- Examined the Vitreous Fluid and/or Urine Glucose Concentrations in 1,335 Civil Aviation Accident Pilot Fatalities.
- Completed the formulation of the ISO 27368 Blood Gas Analysis International Standard.
- A new equation was developed to prevent false negative drug results.

- Biomarker Response to Altitude: The test phase of two studies to assess gene expression changes that occur as a result of exposure to decreased oxygen levels have been completed.
- Biomarker Response to Alcohol: Gene expression studies have been developed to identify biomarkers associated with alcohol consumption of levels up to 0.08%.
- Biomarker Response to Fatigue: A preliminary study of the effects of fatigue was undertaken in collaboration with the United States Air Force.

Protection and Survival

- Evacuation Models: A computer simulation of airliner emergency evacuation was developed and demonstrated for both narrow and wide body aircraft.
- Comprehension of Safety Material and Signs - Commercial Airliner "EXIT" signs and symbols were evaluated.
- Comprehension of Safety Briefing Card Pictorials and Pictograms was evaluated.
- Mathematical Prediction of the Effectiveness of Emergency Evacuation Aids (slides) – model continued development
- Assessed the inflation Performance of Emergency Escape Slides at High Altitude.
- Occupant Seat/Restraint Models: Measures of accuracy for dynamic mathematical models have been developed and tested.
- Side Facing Seat Safety Criteria: A study of the injury potential of side facing seats using a specialized anthropomorphic test dummy has been completed.
- Assessed head and neck injury potential for occupants of typical aircraft seats and interior configurations during forward impacts.

Aviation Physiology

- Software: Refined equations used for the calculation of radiation doses received by pilots and crew were completed and implemented into the early warning radiation alert system.
- Determined the cosmic radiation exposure of aircraft occupants on simulated high-latitude flights during solar proton events from 1986 through 2008.
- In conjunction with Harvard University, a study was completed on the effect of normal cabin altitude in an older (50-80 years old) and less than healthy (smokers/cardiac conditions) passenger population.
- Supported the field evaluation of whole airliner decontamination technologies; wide-body aircraft with dual-use application for railcars in support of the RITE effort.
- Contributed to the development of Guidelines for Life Support Equipment and Cabin environment issues - crew and passenger safety requirements for very high altitude air or spacecraft.
- Contributed to training recommendations for occupants of orbital or suborbital vehicles.
- Conducted a review of Technical Order and AC addressing the exposure of pilots & crew to excessive levels of carbon monoxide.

Airliner Cabin Environment Research Program

- Aircraft Decontamination System: Complete field evaluations of an aircraft thermal decontamination system. The system uses the complementary dual decontamination technologies of thermal desorption (high temperature and relative humidity) and vaporized hydrogen peroxide to kill a full spectrum of biological agents. The evaluations were performed on a McDonnell Douglas DC-9 and a Boeing-747 aircraft.
- Collaborative research with CAMI (RITE – Harvard University): to assess the physiological effects of 7,000 ft cabin altitudes on passengers with chronic and stable cardiac and/or pulmonary disease.
- Extensive study of the chemicals deposited on high efficiency particulate air (HEPA) filters during airliner service; identification of key markers of contamination.
- Conducted chamber studies with older and health compromised subjects.
- Development of miniature sensor array for chemical and physical assessment of the aircraft cabin.

- Laboratory demonstration of an electrochemical sensing technique for the detection of tricresyl phosphate - one of the principal chemicals of concern during contamination of bleed air from jet engine lubricants.
- Identified previously unanticipated ozone reaction chemistry to form volatile organic compound contaminants.
- Collected 4,000 health surveys of flight attendants for underlying and occupational related health conditions and begun statistical analysis air quality incidents.
- Developed protocol for measuring critical cabin pressures for at-risk passengers and crewmembers.
- Developed protocol for onboard pesticide sampling.
- Initiated research collecting baseline data for volatile organic compound contaminants on loaded filters.
- Completed materials compatibility studies of aluminum aerospace alloys and airliner cabin textiles with prototype decontamination technology.

FY 2007

CAMI Aeromedical Research Program

- Evaluated the medical aspects of extending first-class FAA medical certificate to 12 months for pilots under age 40.
- Development of software and procedures to support quality assurance evaluation of airman medical records.
- Development of an Aircraft Accident/Injury and Autopsy Data System (AA-IADS).
- Evaluated aircraft windscreen transmittance characteristics as they relate to emerging laser technologies employed in the NAS.
- Performed analysis of civilian air show accidents.
- Evaluated the effectiveness of simulators in upset recovery training.
- Determined the distribution of fluoxetine, vardenafil, glucose, hemoglobin A1c, and sedating antihistaminics levels in postmortem cases from aviation accidents.
- Determined molecular changes as a result of decreased cabin oxygen levels at altitudes with significance to both the aviation industry and military pilots.
- Provided engineering/biodynamic requirements to support revision to TSO-C100 and SAE AS5276.
- Supported development of a cabin evacuation design computer model for very large transport aircraft by developing passenger management strategies using research data from flight attendant location trials.
- Evaluated presentation media for maximum effectiveness in passenger safety briefings.
- Initiated collaborative research with industry partners to develop modeling strategies and validation techniques applicable to aircraft seat certification by analysis.
- Reviewed accidents involving Commemorative Air Force Aircraft 1968 to 2005.
- Evaluated design requirements for pulse oxygen systems to support development of engineering certification criteria.
- Determined the clinical aspects of radiation exposure resulting from a terrorist attack.

Airliner Cabin Environment Research Program

- Collected extensive ozone measurements in aircraft cabin.
- Developed advanced computer simulations for evaluation of airflow and contaminant transport.
- Developed an 11-row airliner mock-up for experimental validation of computational models.
- Completed development and full scale demonstration of prototype biological decontamination system for narrow-body and wide-body aircraft using thermal heat and vaporized hydrogen peroxide.
- Tested of a range of commercial off-the-shelf biosensors for aircraft cabin environment completed.

FY 2006

CAMI Aeromedical Research Program

- Completed gene expression research review to identify fatigue in collaboration with the US Air Force.
- Development of computer-modeling methods will provide faster, safer, more cost-effective aircraft certification decisions.
- Conducted initial evaluations of lap belt and shoulder strap mounted airbags.
- Provided near real-time warning of solar events, with recommendations for reduced aircraft flight altitudes and potential diversions for polar routes.

Airliner Cabin Environment Research Program

- An experimental study using a ground-based ozone exposure facility that simulates the interior of the airliner cabin was completed and analysis of the resulting data started to be analyzed and in-flight ozone measurements were commenced.
- Pesticides sampling procedures were developed in the laboratory for pesticides.
- Protocols for the Air Quality Incidents and establishment of an Incident Reporting System for air quality incident study were developed.
- Survey of potential physical and chemical decontamination technologies was completed.
- The first generation of a full-scale demonstration of combining the vapor hydrogen peroxide (VHP), specified by Congress as a benchmark, with enhanced environmental preconditioning was constructed and initial testing undertaken. Protocols for a formal evaluation of the full-scale demonstration were developed.

FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

CAMI Aeromedical Research Program

Aeromedical Safety Management System

- Aerospace Medical Research Scientific Information System (SIS): Applied and validated it by addressing disqualifying pathologies: 1) complete atrial fibrillation, 2) complete female pilot, and 3) continue diabetes.
- Aerospace Accident Injury and Autopsy Data System (AAIADS): Continued collaboration with AQS (ASIAS) in support of safety management system concepts as applied to aerospace medicine.

Accident Prevention and Investigation

- Gene Expression Changes in Response to Fatigue: Continued to develop methods and tools to manage risks to human safety in stressful aviation environments.
- Analyzed post-mortem aviation accidents for fatigue gene expression; Collected new specimens, identify biomarkers, and perform pathway analysis.
- Prevalence of Abused Drugs: Examined the prevalence of abused drugs by region, drug type, pilot certificate type, pre-employment vs. random and other factors critical for rule-making on drug abatement.

Protection and Survival

- Side Facing Seat Certification: Used recent research findings to develop comprehensive technical requirements for certification of side facing seats towards developing new policy.
- Oblique Seat Injury Potential: Evaluated the unique occupant kinematics and loading that could occur in impacts involving oblique seat installations.
- Aviation Child Restraint Certification: Developed the specifications and test requirements needed to support certification of advanced aviation child restraint systems; potential revision to TSO-C100.
- Passenger Aircraft Safety and Emergency Information Resources: Assessed the degree of understanding by passengers.
- Mathematical Prediction of Emergency Evacuation Performance.
    - Continued support of potential technical revision of TSO C69
    - Evaluated Inflation Performance of Emergency Escape Slides at High Altitude.

Aviation Physiology

- Pulse Oxygen Systems: Developed a methodology to assess physiological models of high altitude breathing systems to support certification of systems proposed for use in the B-747 and other aircraft.
- Hypoxia Training Devices: Compared learning experience and symptoms when using portable devices (tent, mask) and an altitude chamber to make an individual hypoxic.

Airliner Cabin Environment Research Program

- Developed and collected data to identify technologies and/or operational procedures to reliably bring cabin ozone and cabin pressure levels within current FARs or to address potential rulemaking activities for revising cabin pressure and ozone regulations.
- Quantified the effects of cabin pressure on individuals at risk due to age and/or health status.
- Conducted preliminary assessment of the compatibility of aircraft materials, such as high strength steels and aerospace composites materials, with decontamination technology to determine which products are safe to use on aircraft and which could damage the aircraft materials and potentially compromise the continued airworthiness of the aircraft.
- Demonstrated the feasibility of detecting tricresyl phosphate (TCP) from hot air streams to determine whether TCP levels that could affect health of the crew can be detected in aircraft cabins.
- Developed state-of-the-art computer simulation for influenza transmission within aircraft cabins to determine where bioaerosol droplets may be spread in addition to close to infected passengers.
- Conducted preliminary assessment of the effectiveness of new influenza control methodologies to mitigate spread of influenza to passengers and crew members.
- Evaluated exposure risk for pesticides and volatile organic compound contaminants to determine levels of contaminants and the potential health effects to humans.
- Collected and analyzed data on airliner cabin environment relative humidity, temperature, ozone, carbon dioxide, volatile organic compounds, and sound levels to determine levels and potentially revise or create new regulations.
- Collected baseline data for volatile organic compound contaminants on loaded aircraft filters to determine what can be detected on aircraft filters and what, if any, effects there may be from the contamination to passengers and crew members.

FY 2010 PROGRAM REQUEST:

CAMI Aeromedical Research Program

Ongoing Activities

- Validate mathematical models to evaluate whether aircraft designs meet requirements for evacuation and emergency response capability.
- Establish design criteria for restraint systems that protect occupants at the highest impact levels that the aircraft structure can sustain.
- Apply advances in gene expression technology, toxicology, and bioinformatics to define human response to aerospace stressors including alcohol, drugs, hypoxia, and fatigue. Develop methods to collect and assess environmentally responsive genes and their protein products in the context of normal and abnormal physiologic states. Utilize machine learning techniques to develop a robust gene-set predictive for these stressors, towards a "genomics black-box" to support accident investigation and minimize risk to human safety and health.
- Incorporate aerospace medical issues in the development of safety strategies concerning upset recovery, controlled flight into terrain (CFIT), and other forms of loss of aircraft control: As adaptive-control techniques are developed, assess pilot performance relative to aeromedical considerations - e.g., transfer of training from various classroom methodologies in the ground, to operations in static and dynamic simulators emulating physiologically stressful flight conditions (e.g., altitude and acceleration/acrobatic maneuvers), and ultimately in-flight.
- Develop advanced methods to extract aeromedical information for prognostic identification of human safety risks. Evaluate factors pertinent to aeromedical safety including disqualifying

pathologies; pilot age; fatigue; the physiologic basis of issues commonly labeled "pilot error" such as spatial disorientation, loss of situational awareness, and confusion; assessment of toxicological findings in terms of historical medical certification data; detection and aeromedical assessment of new medications and their interactions; effectiveness of emergency response procedures and equipment; and special issues (stow-always, type aircraft, laser/radiation threats, and commercial space transportation). Enable evidence-based medical certification and effective knowledge management. Develop new metrics to better understand aeromedical certification trends and future requirements to facilitate this process, including related education/training programs.

- Develop a methodology to compile, classify, and assess aviation-related injuries, the mechanisms that resulted in these injuries, and their relationship to: autopsy findings, medical certification data, aircraft cabin configurations, and biodynamic testing: Aerospace Accident Injury and Autopsy Data System (AAIADS).

New Initiatives

- Seat Cushion Component Test Methods: Develop methods for replacement of worn seat cushions.
- Develop analytical procedures to assess the smoke toxicity of advanced materials for post-crash survivability.
- Develop analytical procedures to assess alternative aviation fuels vapor toxicity.

Airliner Cabin Environment Research Program

Ongoing Activities

- Evaluate synergistic health effects of carbon monoxide, carbon dioxide and ozone under mild hypoxic conditions.
- Collect and analyze data on airliner cabin environment relative humidity, temperature, ozone, carbon dioxide, volatile organic compounds, and sound levels to determine potential health effects.
- Evaluation of exposure risk for pesticides and volatile organic compounds contaminants.
- Collect baseline data for measuring volatile organic compound contaminants on loaded aircraft filters.
- Develop advanced air chemistry models for interaction of atmospheric ozone and volatile organic compounds and their effects on cabin air quality.
- Develop real-time intelligent sensing of cabin air quality on airliners.
- Develop advanced microstructured catalytic materials for ozone conversion.
- Apply advances in weather modeling to predict atmospheric ozone disturbances that could affect cabin air quality.
- Asses risk and manage the infectious disease transmission on airliners.
- Continue preliminary assessment of aircraft material compatibility of high strength steels and aerospace composites materials with disinfection technologies.
- Quantify the effects of cabin pressure on individuals at risk due to age and/or health status.
- Evaluate and identify technologies and/or operational procedures to reliably bring cabin ozone and cabin pressure levels within current FARs.

New Initiatives

- Develop and test adaptive environmental control techniques to enable a safe and healthy cabin air environment including in-flight incidents.
- Validate software tools and methods to mitigate air contamination incidents during flight and ground operations.
- Identify potential impacts of more fuel efficient advanced airliner environmental control system and related engine designs on cabin air quality.
- Assess role of advanced weather modeling technology to predict atmospheric ozone disturbances in the aircraft cabin.
- Preliminary assessment of the efficacy of new influenza control methodologies.
- Evaluate viral outbreak mitigation strategies and methodologies for cost effect reduction of impact to the air transportation system.

KEY FY 2010 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

CAMI Aeromedical Research Program

Aeromedical Safety Management System

- Complete application of Aerospace Medical Research Scientific Information System (SIS): DIABETES.
- Aerospace Accident Injury and Autopsy Data System (AAIADS) continued development.

Accident Prevention and Investigation

- Gene Expression Changes in Response to Fatigue: Continue to develop methods and tools.
- Analyze post-mortem aviation accidents specimens for fatigue gene expression.
- Assess prevalence of abused drugs.
- Develop analytical procedures to assess the smoke toxicity of advanced materials for post-crash survivability.
- Develop analytical procedures to assess alternative aviation fuels vapor toxicity.

Protection and Survival

- Complete:
  - Assessment of Oblique Seat Injury Potential.
  - Aviation Child Restraint Certification: Develop the specifications and test requirements - TSO-C100.
  - Evaluation of Passenger Aircraft Safety and Emergency Information Resources.
  - Mathematical Prediction of Emergency Evacuation Performance.
  - Inflation Performance of Emergency Escape Slides at High Altitude.
  - Seat Cushion Component Test Methods: Develop methods for replacement of worn seat cushions.

Aviation Physiology

- Complete methodology to evaluate Pulse Oxygen Systems.
- Complete evaluation of Hypoxia Training Devices.

Airliner Cabin Environment Research Program

- Provide scientific knowledge base on medical effects of combined exposures to carbon monoxide, carbon dioxide and ozone from mild hypoxic conditions associated with reduced air pressures.
- Evaluate toxicological aspects of cabin environmental (air) quality: development of reference laboratory to support aircraft cabin air contaminants analysis.
- Validate computational models of air contaminants, volatile organic compounds; biological and viral contaminants to evaluate health impacts on passengers and crew.
- Characterize the potential impact on aircraft fuel efficiency gains due to new environmental control system materials, sensing systems and methodologies.
- Develop updated scientific databases of atmospheric ozone concentrations and route planning tools.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2008)	132,418
FY 2009 Enacted	8,395
FY 2010 Request	10,378
Out-Year Planning Levels (FY 2011-2014)	43,889
Total	$195,080

Budget Authority ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Contracts:					
CAMI Aeromedical Research	3,569	1,504	1,712	2,038	1,811
Airliner Cabin Environment	0	0	0	0	2,000
Personnel Costs	5,091	5,893	5,893	6,177	6,342
Other In-house Costs	140	145	155	180	225
Total	8,800	7,032	7,760	8,395	10,378

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Basic	0	0	0	0	0
Applied	8,800	7,032	7,760	8,395	10,378
Development (includes prototypes)	0	0	0	0	0
Total	8,800	7,032	7,760	8,395	10,378

A11.j. – Aeromedical Research Product and Activities	FY 2010 Request ($000)	Program Schedule					
		FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
086-110 CAMI AEROMEDICAL RESEARCH (CAMI)	1,811						
1. Validate mathematical models - evacuation and emergency response capability.		♦	◊	◊	◊		
2. Establish design criteria for restraint systems.		♦	◊	◊	◊		
3. Develop gene expression, toxicology, and bioinformatics technology and methods to define human response to aerospace stressors.		♦	◊	◊	◊	◊	◊
4. Incorporate aerospace medical issues in the development of safety strategies- aeromedical aspects of human performance.		♦	◊	◊	◊	◊	◊
5. Perform Aeromedical Safety Risk Management: identify human safety risks.		♦	◊	◊	◊	◊	◊
• 6. Develop Aerospace Accident Injury and Autopsy Data System (AAIADS)		♦	◊	◊	◊	◊	◊
086-111 AirlineR Cabin Environment Research	2,000						
• 1. Develop and analyze methods to detect and analyze aircraft cabin contamination.		♦	◊				
• 2. Computational models of air contaminants, volatile organic compounds, biologicals and virals		♦	◊				
• 3. Advanced air sensing technology for volatile organic compounds.		♦	◊	◊			
• 4. Bleed air contamination models of engine compressors and high temperature air system.		♦	◊	◊			
• 5. Support of regulatory, certification, and operations for existing Aviation Rulemaking Committees.		♦	◊	◊	◊	◊	◊
• 6. Chemical kinetic models for bleed air systems for health and safety effects on passengers and crew.		♦	◊	◊	◊		
Personnel and Other In-House Costs	6,567						
Total Budget Authority	10,378	8,395	10,378	10,621	10,848	11,086	11,334

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A11.k.	Weather Program	$16,789,000

GOALS:
This program supports the following Flight Plan goals: Increased Safety and Greater Capacity.

Intended Outcomes: The Weather Program helps achieve FAA's strategic goal of increasing aviation safety by reducing the number of accidents associated with hazardous weather conditions. The Weather Program strives to increase capacity by reducing the impacts of adverse weather events on the operational capacity of the National Airspace System (NAS). This research program also supports FAA Flight Plan goals of greater capacity. Additionally the Weather Program is performing the research necessary to meet the requirements of the NextGen Integrated Work Plan (IWP). The FAA efforts undertaken in collaboration with the National Weather Service (NWS) and NASA increase FAA's ability to provide improved short-term and mid-term forecasts of naturally occurring atmospheric hazards, such as turbulence, severe convective activity, icing, and restricted visibility. Improved forecasts enhance flight safety, reduce air traffic controller and pilot workload, enable better flight planning, increase productivity, and enhance common situational awareness.

Agency Outputs: The weather research program develops new and improved weather algorithms for NAS platforms such as the Weather and Radar Processor, the Integrated Terminal Weather System, the Operational and Supportability Implementation System, the Advanced Technologies and Oceanic Procedures, the Dynamic Ocean Track System, and the Enhanced Traffic Management System. The NWS platforms also use these improved algorithms. The weather research program also provides knowledge that can be used by the FAA to support design approvals for weather data link systems and to issue appropriate operational approvals for weather products for use in the cockpit.

The weather capabilities developed by FAA provide the following benefits:

- Depiction of current and forecasted in-flight icing areas – enhances safety and regulatory adherence.
- Interactive data assimilation, editing, forecast and dissemination tools – improves aviation advisories and forecasts issued by the NWS as well as accessibility to users of aviation weather information.
- Depiction of current and forecast precipitation type and rate – enhances safety in the terminal area.
- Depiction of current and forecast terminal and en route convective weather – enhances terminal and en route capacity.
- Short-term prediction and forecast of ceiling and visibility in the national area – enhances en route safety.
- In-situ, remote detection, and forecast of en route turbulence, including clear-air turbulence – enhances en route safety.

Research Goals: Research is on-going to provide weather observations, warnings, and forecasts that are more accurate, accessible, and efficient, and to meet current and planned regulatory requirements. The goals of the research are:

- By FY 2012, development of timely and accurate deterministic (and an initial set of probabilistic) aviation weather forecast data for operational use by ATM, dispatchers, and pilots.
- By FY 2016, development of improved accuracy of deterministic and an expanded set of probabilistic aviation weather forecast data for operational use by ATM, dispatchers, and pilots.

Customer/Stakeholder Involvement: The Weather Program works within FAA, industry and government groups to assure its priorities and plans are consistent with user needs. This is accomplished through:

- Close collaboration with FAA organizations such as the Air Traffic Organization Oceanic and Off-Shore Programs Office, various Aviation Safety Offices.
- Guidance from the FAA Research, Engineering, and Development Advisory Committee.
- Inputs from the National Aviation Weather Initiatives, which are strongly influenced by other NAS drivers including "Safer Skies" and Flight Plan Safety Objectives.

- Guidance from the Joint Planning and Development Office Next Generation Air Transportation System initiative.
- Inputs from the aviation community, such as the annual National Business Aircraft Association /Friends/Partners in Aviation Weather Forum, and scheduled public user group meetings.
- Feedback received from documents and publications.

R&D Partnerships: The Weather Program collaborates with the Department of Commerce in promoting and developing meteorological science, and in fostering support of research projects through the use of private and governmental research facilities. The program also leverages research activities with members of industry, academia, and other government agencies through interagency agreements, university grants, and Memorandums of Agreement.

Partnerships include:

- National Center for Atmospheric Research (in-flight icing, convective weather, turbulence, ceiling and visibility, ground de-icing, modeling, weather radar techniques).
- National Oceanic and Atmospheric Administration laboratories (convective weather, turbulence, modeling, weather radar techniques, quality assessment/verification).
- Massachusetts Institute of Technology's Lincoln Laboratory (convective weather).
- National Weather Service's Aviation Weather Center and Environment Modeling Center (modeling).
- Naval Research Laboratory (volcanic ash, flight level winds).
- NASA Research Centers (in-flight icing, turbulence, satellite data).
- Army Cold Regions Research and Engineering Laboratory (in-flight icing).
- Universities (modeling).
- Airlines, port authorities, cities (user assessments).

Accomplishments:

FY2008:

- Implemented an experimental rapid refresh Weather Research and Forecast (WRF) model.
- Implemented turbulence detection algorithm into NEXRAD operations.

FY2007:

- Implemented in-flight icing severity nowcast capability operationally
- Obtained approval of turbulence detection algorithm by NWS NEXRAD System Recommendation and Evaluation Committee for operational implementation.
- Provided Helicopter Emergency Medical Services Aviation Digital Data Service (ADDS) enhancement to enable emergency medical services pilots to make NO-GO weather decisions.

FY2006:

- Obtained approval of in-flight icing severity nowcast capability for operational use.
- Implemented four-hour winter precipitation capability into Weather Support to Decision Making System.
- Implemented terminal convective weather forecast capability into Integrated Terminal Weather System.

FY2005:

- Implemented improved accuracy and resolution of data on upper winds, temperature, and moisture through 13 kilometer rapid-update-cycle analyses and forecasts at the NWS.
- Implemented in-flight icing nowcast capability with higher resolution into ADDS.

Previous Years:

- Achieved the Department of Commerce 2003 Silver Medal.
- Implemented operationally new capabilities of:
- Current and up to two-hour forecast of convective weather.
- Current and up to 12-hour forecast of in-flight icing conditions
- Current and up to 12-hour forecasts of clear-air turbulence above 30,000 feet.

- Up to 12-hour forecast of marine stratus burn-off at San Francisco International Airport.
- Implemented operationally at the NWS the enhanced ADDS with a flight path tool depicting vertical cross sections of weather along user-specified flight routes.
- Completed convective storm growth and decay field tests in Dallas, Orlando, Memphis, and New York. This research resulted in the accurate short-term prediction of the initiation, growth, and decay of storm cells, and enhanced the strategic and tactical flow management planning that allows more effective routing of traffic to and from airports and runways.

FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Obtained FAA approval to test in-flight icing forecast capability for Alaska.
- Transitioned turbulence forecast greater than 10,000 feet for implementation on operational ADDS.
- Developed a consolidated convective weather forecast capability with probabilistic forecasts and weather avoidance fields.
- Transitioned CONUS display of ceiling, visibility, and flight category analysis capability for implementation on operational ADDS.
- Conducted testing of the Rapid Refresh Weather Research and Forecast (WRF) model.
- Obtained FAA approval to test volcanic ash dispersion and oceanic flight level winds forecast capability.
- Improved in-flight icing forecasts via enhanced polarimetric measurement in low-reflectivity clouds.
- Developed prototype Network-Enabled Verification Service for meeting System Wide Information Management architecture requirements.
- Conducted quality assessment evaluations, automated verification tools, of weather research capabilities to support the FAA/NWS NextGen Weather Evaluation Capability process.
- Completed guidance for certification of airborne weather radar with turbulence detection capability for additional aircraft types.
- Determined liquid water equivalent (LWE) rate & resultant intensity for snow, freezing rain & freezing drizzle

FY 2010 PROGRAM REQUEST:

Ongoing Activities

The weather program will continue to develop/enhance forecast/nowcast capabilities, to support FAA safety and capacity Flight Plan goals and meet NextGen IWP requirements, through the conduct of applied research in naturally occurring atmospheric hazards including turbulence, severe convective activity, icing, and restricted visibility. In FY2010, additional turbulence forecast capabilities are being developed to enhance en route safety and capacity, a consolidated convective weather forecast is be developed to enhance terminal and en route capacity, an in-flight icing forecast capability for Alaska is being developed to enhance safety especially for general aviation, and a ceiling and visibility forecast capability is being developed to enhance en route safety especially for general aviation. Capabilities developed transition to NWS, FAA, and industry weather systems.

New Initiatives

No new initiatives are planned in FY 2010

KEY FY 2010 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Upgrade in-flight icing forecast and nowcast severity capability for WRF rapid refresh.
- Develop in-flight icing forecast capability for Alaska.
- Demonstrate Northeast corridor 0-6 hour consolidated convective weather forecast capability via NNEW.
- Transition probabilistic and mountain-wave turbulence forecast for implementation on operational ADDS
- Develop CONUS display of ceiling, visibility, and flight category forecast capability.

- Integrate Canadian radar data into the real-time national three dimensional radar mosaics.
- Demonstrate global capability for volcanic ash plume dispersion forecast.
- Utilize rapid refresh WRF model forecasts to produce probabilistic forecasts for convection and ceiling/visibility.
- Demonstrate initial operating capability for NEVS utilizing output from consolidated convective weather forecast capability
- Conduct quality assessment evaluations, utilizing automated verification tools, of weather research capabilities to support the FAA/NWS NextGen Weather Evaluation Capability (NWEC) process.
- Develop specification for operational approval of liquid water equivalent technology for ground de-icing guidance.
- Transition WRF rapid refresh model for implementation into NWS operations

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2008)	371,613
FY 2008 Appropriated	16,968
FY 2009 Enacted	16,789
Out-Year Planning Levels (FY 2011-2014)	64,283
Total	$469,653

Budget Authority ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Contracts:					
Weather Program	19,212	18,432	15,936	15,855	15,750
Personnel Costs	1,074	1,035	863	979	862
Other In-house Costs	90	78	89	134	177
Total	20,376	19,545	16,888	16,968	16,789

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Basic	0	0	0	0	0
Applied	20,376	19,545	16,888	16,968	16.789
Development (includes prototypes)	0	0	0	0	0
Total	20,376	19,545	16,888	16,968	16.789

A11.k. – Weather Program – Product and Activities	FY 2010 Request ($000)	Program Schedule					
		FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
041-110 Aviation Weather Analysis and Forecasting							
Convective Analysis and Forecast Improvement	5,220						
Developed consolidated conv wx forecast capability		♦		◊	◊		
Demo NE 0-6 hour consolidated conv wx forecast via NNEW			◊				
Improved in-flight icing forecasts via enhanced NEXRAD polarimetric measurements in low-reflectivity clouds		♦					
Integrate Canadian radar data into real/time national 3D mosaic			◊				
Analysis and Forecast Improvement	6,017						
Obtained FAA approval to test in-flight icing forecast capability for Alaska		♦					
Upgrade in-flight icing fc & nc severity for WRF RR			◊				
Develop in-flight icing forecast capability for Alaska			◊				
Transition AK in-flight icing forecast capability for implementation on operation ADDS.				◊			
Obtained FAA approval to test global in-flight icing forecast capability					◊		
Conducted test of WRF RR model		♦					
Transition rapid refresh WRF model for implement. into NWS			◊				
Implement RR WRF model fcs for probabilistic conv & C&V			◊				
Transitioned turb forecast >10,000 ft for implementation on operational ADDS		♦					
Transition probabilistic and mountain wave turbulence forecast capability for implement on operational ADDS			◊				
Transition convectively-induced turbulence forecast capability for implement on oper. ADDS				◊			
Transition probabilistic turbulence nowcast for implement. on oper ADDS							◊
Transitioned CONUS display of ceiling, vis. & flt. category analysis capability for impl. on oper. ADDS		♦					
Develop CONUS ceiling, visibility, and flight category forecast capability			◊				
Obtain FAA approval to test AK C&V 3D cloud probabilistic forecast/ncst							◊
Obtained FAA approval to test volcanic ash dispersion fc		♦					
Demo global capability for VA plume dispersion forecast			◊				
Obtain FAA approval of volcanic ash disp fc for oper read.						◊	
Verification and Technology Implementation	4,513						
Developed prototype Network-Enabled Verification Service (NEVS) for meeting SWIM architecture requirements		♦					
Demonstrate IOC for NEVS utilizing conv wx fc capability			◊				
Implement FAA approved products at the AWC		♦	◊	◊	◊	◊	◊
Conduct QA evaluations for NWEC process		♦	◊	◊	◊	◊	◊
Completed guidance for cert. of airborne weather radar with turb detection capability for additional aircraft		♦					

Determined LWE rate & resultant intensity for snow, frz rain & frz drizzle		♦					
Develop specification for operational approval of liquid water equivalent for ground de-icing guidance			◊				
Personnel and Other In-House Costs	1,039						
Total Budget Authority	16,789	16,888	16,789	16,580	16,251	15,906	15,546

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A11.l.	Unmanned Aircraft Systems Research	$3,467,000

GOALS:
This program supports the following Flight Plan goal: Increased Safety.

Intended Outcomes: The Unmanned Aircraft Systems (UAS) Research Program supports FAA's strategic goal of increasing safety by conducting research needed to ensure the safe integration of the UAS in the NAS. This research program also supports the development of aircraft technologies to meet requirements of NextGen enablers that facilitate the implementation of NextGen operational improvements (OIs). The program's research activities focus on new technology assessments, methodology development, data collection and generation, laboratory and field validation, and technology transfer.

Agency Outputs: Researchers are developing methodologies and tools to define UAS design and performance characteristics. They are evaluating technologies, conducting laboratory and field tests, performing analyses and simulations, and generating data to support standardization of UAS civil operations. New standards are being implemented to establish UAS certification procedures, airworthiness standards, operation requirements, inspection and maintenance processes, and safety oversight responsibilities. Policies and guidance materials are also being published to equip FAA certification engineers and safety inspectors with the knowledge and tools they need to ensure the safe integration of UAS into the NAS.

Research Goals: To safely integrate UAS into the NAS, FAA needs to develop airworthiness standards, devise operational requirements, establish maintenance procedures, and conduct safety oversight activities. The program is structured into seven research areas: technology survey; detect, sense and avoid (DSA); control, command, and communication (C3); flight termination, system safety, certification and airworthiness standards, and maintenance and repairs. The research began with a baseline survey to determine the existing technologies used in UAS and needs of corresponding regulatory standards. Technologies used to avoid mid-air collisions due to UAS operations will be examined and tested. Communications issues that may arise due to the introduction of UAS into the NAS, as well as necessary safety procedures for the flight termination of UAS, will be researched. A system safety approach based on regulatory framework will be developed to identify the potential hazards, perform risk assessments, and evaluate mitigation strategies for UAS safe operations in the NAS. Data systems will be established to collect data on UAS design, operation, and maintenance that will provide technical information to support the development of design and operation standards and provide technical basis for safety oversight.

- By FY 2010, complete UAS technology survey and gap analysis and document results in technical reports.
- By FY 2012, determine performance characteristics and operational requirements for DSA technologies.
- By FY 2012, analyze data on the safety implications of system performance impediments to C3 in different classes of airspaces and operational environment.
- By FY 2012, develop risk management concepts, models, and tools for unmanned aircraft systems.
- By FY 2015, conduct field evaluations of UAS technologies in an operational environment, including DSA, C3, and flight termination technologies. The documented results will be used to develop certification and airworthiness standards.

Customer/Stakeholder Involvement: Full and safe integration of UAS into civil aviation requires FAA to work closely with other government and private agencies that have experience in developing and operating UAS:

- FAA Research, Engineering, and Development Advisory Committee Aircraft Safety Subcommittee – subcommittee representatives from industry, academia, and other government agencies annually review the activities of the program.
- Technical Community Representatives Groups – FAA representatives apply formal guidelines to ensure that results derived from these research activities will be implemented to meet the stated Agency Outputs as outlined above.
- Department of Defense (DoD) – the DoD is the largest UAS user requesting unrestricted access to the NAS. The FAA will collaborate with DoD through Memorandum of Understanding (MOU) and

Interagency Agreements (IA) to leverage resources and implement new technologies for civil applications.

- Other Government agencies including Department of Homeland Security (DHS), Department of Commerce (DOC), state government agencies, and independent organizations that utilize UAS for national security, earth science and oceanic studies, and commercial applications.
- JPDO – the JPDO has identified UAS integration to NAS and new aircraft technology as one of the emerging challenges to the nation's air transportation system. In particular, the NextGen related research will be coordinated with the JPDO Aircraft Working Group activities in support of aircraft equipage requirements and necessary enablers to fully utilize NextGen capabilities.

R&D Partnerships:

- IA's with other government agencies (DoD, DHS, DOC, state governments) and Memorandum of Cooperation (MOC) with foreign civil aviation authorities.
- FAA Air Transportation Center of Excellence – various consortiums of university and industry partners who conduct R&D for FAA on a cost-matching basis, which currently consists of seven centers in different technical disciplines.
- The Civil Aviation Authority of the Netherlands to conduct joint research on UAS initiatives via an MOC.

Accomplishments:

FY2008:

- Completed technology surveys of UAS propulsion systems and regulatory gap analyses.
- Completed survey of existing DSA capabilities and regulatory requirement analysis.
- Developed UAS hazard categorization and analysis system (HCAS) within the regulatory framework including standard taxonomy.
- Completed the second sets of FAA-United States Air Force (USAF) joint flight tests to study on-board DSA technology with multiple sensors and data fusion system.
- Conducted technology survey on UAS designs and operations.
- Begin determining potential safety implications of system performance impediments to C3.
- Conducted technology survey on UAS flight termination and recovery.

FY2007:

- Completed the first set of FAA-USAF joint flight tests to evaluate a DSA technology.

FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Continued technology surveys on UAS designs and operations.
- Continued technology surveys on UAS flight termination and recovery.
- Determined performance characteristics and operational requirements for DSA technologies.
- Continued FAA-USAF joint flight tests to study on-board DSA technology.
- Continued to identify potential safety implications of system performance impediments to C3.
- Established safety management system (SMS) approach and develop methodology to identify system-level risks and associated causal factors for safety integration of UAS in the NAS.
- Developed risk management concepts, models, and tools for unmanned aircraft systems.
- Performed risk analysis to determine impacts of specific hazards, mitigation strategies, recommended approaches, safety measurements, and oversight requirements.
- Established UAS data collection and information system.

FY 2010 PROGRAM REQUEST:

New Initiatives:
None.

KEY FY 2010 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Complete technology surveys on UAS designs and operations.
- Complete technology surveys on UAS flight termination and recovery.
- Determine performance characteristics and operational requirements for DSA technologies. Included will be the development and evaluation of specific DSA technologies including both on-board and ground based systems in compliance of regulatory requirements (airworthiness and flight operations).
- Continue FAA-USAF joint flight tests to study on-board DSA technology.
- Determine potential safety implications of system performance impediments to C3.
- Develop and evaluate UAS C3 technologies to ensure operational safety including data link requirements, frequency spectrum technology, availability and reliability, communicating with ATC, and interactions with other NAS users.
- Continue to develop a methodology to identify system-level risks and associated causal factors for safety integration of UAS in the NAS.
- Develop risk management concepts, models, and tools for unmanned aircraft systems.
- Perform risk analysis to determine impacts of specific hazards, mitigation strategies, recommended approaches, safety measurements, and oversight requirements.
- Develop UAS data collection and information system and conduct system safety analysis on specific UAS operations.
- Initiate the collection of UAS operation data and perform analyses to develop technical information required to support establishment of regulatory standards.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2008)	4,120
FY 2009 Enacted	1,876
FY 2010 Request	3,467
Out-Year Planning Levels (FY 2011-2014)	13,895
Total	$23,358

Budget Authority ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Contracts:					
Unmanned Aircraft System Research	0	1,200	2,768	735	2,368
Personnel Costs	0	0	136	1,080	1,024
Other In-house Costs	0	0	16	61	75
Total	0	1,200	2,920	1,876	3,467

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Basic	0	0	0	0	0
Applied	0	1,200	2,920	1,876	3,467
Development (includes prototypes)	0	0	0	0	0
Total	0	1,200	2,920	1,876	3,467

A11.l. – Unmanned Aircraft Systems Research Product and Activities	FY 2010 Request ($000)	Program Schedule					
		FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
069-110 Unmanned Aircraft System Research							
Technology Surveys							
Conduct technology survey on UAS designs and operations		♦	◊				
Conduct technology survey on UAS flight termination and recovery		♦	◊				
Detect, Sense, and Avoid (DSA) Research	789						
Determine performance characteristics and operational requirements for DSA technologies		♦	◊	◊	◊		
Joint USAF-FAA flight tests on DSA technology		♦	◊	◊	◊	◊	
Conduct field evaluation of DSA technology				◊	◊		
Command, Control, and Communications (C3)	789						
Determine potential safety implications of system performance impediments to C3		♦	◊		◊		
Develop and evaluate UAS C3 technologies to ensure operational safety including data link requirements, frequency spectrum technology, availability and reliability, communicating			◊	◊	◊	◊	◊
Study requirements of Ground Control System for certification and operations					◊		
Conduct C3 field tests and evaluate technologies				◊	◊		
Flight Termination							
Determine requirements, risks, and mitigation strategies for flight termination				◊	◊		
Conduct flight termination procedure field test and evaluate technologies						◊	◊
UAS System Safety Management	790						
Develop a methodology to identify system-level risks and associated causal factors for safety integration of UAS in the		♦	◊	◊	◊	◊	◊
Develop risk management concepts, models and tools for unmanned aircraft systems		♦	◊	◊	◊		
Perform risks analyses to determine impacts of specific hazards, mitigation strategies, recommended approaches, safety measurements, and oversight requirements.		♦	◊	◊	◊	◊	◊
Develop UAS data collection and information system and conduct system safety analysis on specific UAS operations.		♦	◊	◊	◊	◊	◊
Collect UAS operation data and perform analyses to develop technical information required to support establishment of regulatory standards.			◊	◊	◊	◊	◊
Personnel and Other In-House Costs	1,099						
Total Budget Authority	3,467	1,876	3,467	3,479	3,476	3472	3,468

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A12.a.	Joint Planning and Development Office (JPDO)	14,407,000

GOALS:
This program supports the following Flight Plan goals: Increased Safety, Greater Capacity, International Leadership, and Organizational Excellence.

Intended Outcomes: As the steward of NextGen, the JPDO seeks to address long-term imbalances in aviation capacity and demand. At the same time, it seeks to ensure that the future operating environment is safe, well managed, environmentally responsible, and harmonized with international standards. JPDO's mission is to lead the transformation of today's aviation system into that of the future, the scope of which contributes to all of FAA's current strategic goals.

NextGen is expected to yield significant benefits in terms of delay reduction, fuel savings, additional capacity, improved access, enhanced safety, and reduced environmental impact. Last year we estimated that NextGen would reduce delay by 35-40 percent in 2018 compared to what the system would experience without NextGen. We are currently preparing an updated, detailed breakdown of the near- to mid-term NextGen benefits. This analysis will be completed in the near future, and updated annually in conjunction with FAA's budget submission.

Agency Outputs: The JPDO is responsible for defining and facilitating the implementation of NextGen. At this stage in the transformation, outputs are a series of plans and analyses that define a proposed end-state and a path for achieving it. The objective is to drive collaborative decisions—involving government and industry—that will ultimately achieve the transformation.

Research Goals:

FY 2010

- Continue to refine NextGen foundational documents: Concept of Operations, Enterprise Architecture, and Integrated Work Plan within the Joint Planning Environment (JPE).
- Enhance the JPE planning information to reflect Integrated Surveillance Study Team results, operational scenarios that describe information sharing and procedures betweenr flight/ airline operations and NextGen trajectory based flight processing including air navigation service provider, flight operations center, and flight crew roles and responsibilities.
- Develop an inter-agency integrated surveillance architecture, concept of operations and funding profile, and governance process recommendation.
- Establish Network Enabled information sharing standards for participating agencies & organizations including multi-agency governance processes.
- Develop FY2012 formulation package to support NextGen resource planning and performance measurement; track and ensure that partner agencies are implementing programs that support a transition to the end-state architecture as defined in the Integrated Work Plan.
- Develop FY2012 formulation package to support NextGen resource planning and development of the NextGen business case.
- Develop FY2012 NextGen business case including results of environmental mitigation methods and benefits.
- Develop Dynamic Airspace Configuration research transition plan that results in a far-term concept for efficient partitioning of airspace and allocation of resources to meet NextGen Capacity needs.
- Continue to coordinate and conduct demonstrations that will test operational concepts, address operational challenges, and provide alternatives for architectural trade-offs. Update the JPE to include demonstration results for NEO Spiral 2, Virtual Tower demonstration, UAS Flight Trials in Florida, Surface Trajectory Based Operations in Memphis, and Oceanic In-trail Climb and Descent Initiative.

FY 2011

- Continue research in key areas such as Trajectory Based Operations and Collaborative Air Traffic Management as well as other priority areas identified in the Integrated Work Plan.
- Based on research results, assist agencies in deploying critical infrastructure for NextGen operations.
- Initiate research in key areas such as Trajectory Based Operations and Collaborative Air Traffic Management.

FY 2012-2014

- Continue research and development to support all NextGen solution sets.

FY 2015 and Beyond

- Continue development to support all NextGen solution sets.
- Identify alternatives as a result of needed research that may be immature.

Customer/Stakeholder Involvement: The JPDO is truly a collaborative enterprise. Employees from NASA and the Departments of Transportation, Commerce, Defense, and Homeland Security actively lead and/or participate in JPDO activities. Similarly, the JPDO Board includes executives from each department/agency, as well as the White House Office of Science and Technology Policy. And the Senior Policy Committee includes Secretaries, Deputy Secretaries, and/or Administrators from the participating organizations, as well as the Director of the Office of Science and Technology Policy.
The private sector is also an integral part of JPDO's work. In FY 2006, the NextGen Institute was established as an alliance of major aviation stakeholder communities. The Institute operates under guidelines set forth in the funding agreement between FAA/JPDO and the host organization, the National Center for Advanced Technologies. The agreement states that the Institute will be governed by a 16-member council that is broadly representative of the aviation community. The Institute supports JPDO by recruiting and assigning industry experts to participate in forums and perform funded technical work. The Institute has already hosted a series of workshops to gather input on research, demonstrations, operational concepts, and financial implications. The Institute performs a variety of tasks in support fo the planning process including studies, demonstration support, and strategic assessments and recommendations for NextGen design issues.

Accomplishments: Major accomplishments and associated benefits of the JPDO efforts include the following:

FY 2009

- Deployed the web-based Joint Planning Environment (JPE) a portal that presents and relates NextGen Enterprise Architecture, Concept of Operations, Integrated Workplan, and Business Case information.
- Enhanced the JPE to reflect a federated architecture for participating agencies' Enterprise Architectures..
- Developed FY2011 Formulation Package to support NextGen resource planning and development of the NextGen business case.
- Developed FY2011 NextGen business case and released NextGen foundational documents consistent with FY2011 plans and priorities: Concept of Operations, Enterprise Architecture, and Integrated Work Plan.
- Continued to coordinate with aviation and aeronautics research programs to ensure that research results in decisions that influence the most effective investment and implementation decision-making.

  • Multi-sector Planner Research Transition Team defined roles & responsibilities that support efficient traffic flow for mid-term operations (2010-2018).
- Consistent with the refined foundational documents, continued to identify and facilitate all pre-implementation activities to support identification and resolution of policy issues, optimized technology transfer, risk management and a broad range of analysis to support decision making.
- Tracked and coordinated changes with partner agencies to ensure that implementing programs supported a transition to the end-state architecture as defined in the Integrated Work Plan.
- Continue to coordinate and conduct demonstrations that validated operational concepts, addressed operational challenges, and provided alternatives for architectural trade-offs. Demonstrations

explored human factors and safety characteristics of trajectory-based operations, high density airport operations, airspace security, and globally interoperable system integration

FY 2008

- Developed FY2010 Formulation Package to support NextGen resource planning and development of the NextGen business case.
- Developed FY2010 NextGen business case
- Released the Enterprise Architecture and Concept of Operations supporting FY2010 planning.
- Released the Integrated Work Plan Version 1, which outlines the steps necessary to achieve the Concept of Operations.
- .
- Expanded NextGen Business Case including initial life-cycle cost/benefit analysis.
- Refined program processes including risk management.
- Defined Net Enabled Information Sharing (NEIS) framework and multi-agency governance
- Established NextGen Network Enabled Weather Program Office and multi-agency governance
- Defined Aviation Safety Information Analysis and Sharing Concept and multi-agency governance
- Established four Research Transition Teams: Trajectory Management, Integrated Arrival/Departure/Surface, Multi-sector Planner, and Dynamic Airspace Configuration, that defined initial plans for research transition from NASA to the FAA in these areas.

FY 2007

- Released Version 2 of the Enterprise Architecture and Concept of Operations.
- Released the initial baseline version of the Integrated Work Plan, which outlines the steps necessary to achieve the Concept of Operations.
- Completed the first NextGen Research and Development Plan, a 5-year view of the research and investment activities required to revise, coordinate, and cost the research and implementation agendas.
- Completed the first NextGen business case (Exhibit 300).

FY 2006

- Developed the NextGen Block-to-Block Concept of Operations and coordinated it through the NextGen stakeholder community for comment and feedback.
- Developed the NextGen Block-to-Block Enterprise Architecture, aligned the Architecture with the Concept of Operations, and began coordination and review through the NextGen stakeholder community.
- Baselined the Operational Improvement Roadmap to set research targets for the Integrated Product Teams.
- Published the NextGen FY 2008 Agency Budget Guidance for Research and Implementation, which begins to align programs to NextGen and identify key research areas.
- Delivered the FY 2005 Progress Report to Congress describing the JPDO's progress in carrying out the NextGen Integrated Plan.
- Developed initial JPDO Systems Engineering Management Plan (SEMP) to facilitate interaction with other agencies and stakeholders.
- Established the Architecture Integration Council, which includes the chief architects for all partner agencies. This body will ensure the cooperation and engagement of the relevant agencies' chief architects during development of the NextGen architecture.

FY 2005

- Made significant progress in resource alignment within the federal government and U.S. industry to develop and implement the NextGen in the most expedient and cost-effective manner.
- Produced and updated the NextGen Integrated Plan as the long-term strategic business plan, detailing goals, objectives, and requirements for eight transformational areas.
- Established and staffed—with federal and industry participants—eight integrated product teams to work collaboratively with government and industry to develop research agendas and strategies for achieving NextGen.

- Performed the first major evaluation of the Operational Vision in Portfolio Segments, to validate the ability to deliver two to three times today's capacity.
- Established the NextGen Operational Improvement Roadmap to guide the transition from today's system to the next generation.
- Developed initial NextGen Segment Portfolios of policy, research and modernization requirements based on the OI Roadmap.

FY 2004

- Initiated resource alignment within the federal government and U.S. industry to develop and implement the NextGen in the most expedient and cost-effective manner.
- Produced the outline for the Integrated National Plan as the long-term strategic business plan for NextGen that detailed NextGen goals and objectives, and requirements for transformation in eight specific areas, each individually significant yet interdependent on the others.
- Produced the framework for establishing with federal and industry participants eight integrated product teams that would work collaboratively with government and industry to plan for and develop research agendas and strategies for achieving NextGen.
- Established the framework for the NextGen Operational Improvement (OI) Roadmap to guide the transition from today's system to the NextGen.
- Developed initial plan for the NextGen Segment Portfolio's of needed policy, research and modernization requirements based on the NextGen OI Roadmap.

FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Continued development of the Enterprise Architecture and Concept of Operations aligned with the Integrated Work Plan. The Enterprise Architecture is a structured documentation of NextGen, capturing the activities, capabilities, data interchanges, and salient relationships associated with NextGen. The Concept of Operations provides a textual operational description of NextGen in the 2025 timeframe. This is a key source to inform and initiate a dialog with the stakeholder community.
  - The Integrated Work Plan provides a long-term transition plan from the current system to that reflected in the Enterprise Architecture and Concept of Operations. It provides a framework to support ongoing planning and will be refined over the planning process to detail analysis of implementation alternatives, risks, costs and benefits as well as prioritization and allocation of resources.
  - These documents will provide the necessary foundational information to define implementation and research guidance to NextGen partner agencies.
- Engaged the Senior Policy Committee on near-term, high priority policy decisions in support of FY012 planning. Continue to use the NextGen Institute to access world-class private sector expertise, tools, and facilities for application to NextGen activities and tasks. The studies to be conducted by the Institute in FY 2010 will further address strategic trade studies that consider the technical, economic, operational, policy, organizational, and temporal dimensions of the NextGen design space.
- Conducted detailed planning and coordinate demonstrations to be undertaken in FY 2010, including Oceanic Trajectory-Based Operations, High Density Airport Operations, Domestic Trajectory-Based Operations, Network Enabled Weather, and Global Interoperability. These demonstrations will test operational concepts, demonstrate technologies that could address operational challenges, and provide alternatives for architectural tradeoffs.
- Continued system-of-system modeling, simulation, and evaluation to ensure benefits, costs, and trade-offs across the full range of NextGen goals.
- Continued outreach efforts aviation trade associations and non-traditional organizations (e.g., groups representing both leisure and business travelers) to solicit views as to how NextGen can best meet the needs of the traveling public.

FY 2010 PROGRAM REQUEST:

Ongoing Activities

- Continue modeling, simulation, and evaluation to ensure benefits, costs, and trade-offs are understood across the full range of goals.

- Revise, coordinate, and cost the research and implementation agendas for subsequent years.
- Refine NextGen business case and work with agencies and industry on research areas and implementation of NextGen-related programs.
- Continue refining foundational documents—Concept of Operations, Enterprise Architecture, and Integrated Work Plan —in response to the outcome of demonstrations, research, changes in agency budgets, etc.
- Refine NextGen metrics.
- Plan FY 2011 operational demonstrations.
- Continue alignment of agency goals and objectives with NextGen goals and objectives.

New Initiatives

- Coordinate demonstrations that will test operational concepts, demonstrate technologies that could address operational challenges, and provide alternatives for architectural tradeoffs.
- Facilitate the transfer of technologies from research programs that are ready for implementation (e.g., NASA, FAA, DHS and DoD Advanced Research Projects Agency program) to the federal agencies with operational responsibilities and to the private sector, as appropriate..

KEY FY 2010 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Planning and Agency/Industry Alignment

- Update, coordinate, and validate NextGen concepts.
- Coordinate aviation and aeronautics research programs to achieve the goal of more effective and directed research that will result in only performing the most promising and applicable research.
- Set goals, priorities and metrics and reporting structure, and coordinate research activities within JPDO member agencies and with U.S. aviation and aeronautical firms.
- Facilitate the transfer of technologies from research programs that are ready for implementation (e.g., NASA and DoD Advanced Research Projects Agency program) to the federal agencies with operational responsibilities and to the private sector, as appropriate.

Systems Integration and Transformation Analysis

- Continue to refine research plans, which will describe research and supporting activities required to drive implementation decisions to effect the NextGen transformation.
- Continue refining foundational documents—Concept of Operations, Enterprise Architecture, and Integrated Work Plan—in response to the outcome of demonstrations, research, changes in agency budgets, etc.
- Continue modeling planned improvements to test their efficacy in accomplishing NextGen goals.
- Conduct analyses, trade studies, and demonstrations to select the best approaches/alternatives for transforming the current air transportation system to NextGen.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2008)	58,399
FY 2009 Enacted	14,494
FY 20010 Request	14,407
Out-Year Planning Levels (FY 2011-2014)	56,555
Total	$143,855

Budget Authority ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Contracts:					
Joint Planning & Development Office	16,539	16,112	12,910	11,221	11,528
Personnel Costs	1,313	1,867	1,256	2,663	2,622
Other In-house Costs	67	121	155	610	257
Total	17,919	18,100	14,321	14,494	14,407

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Basic	0	0	0	0	0
Applied	17,919	18,100	14,321	14,494	14,407
Development (includes prototypes)	0	0	0	0	0
Total	17,919	18,100	14,321	14,494	14,407

A12.a. - Joint Planning & Development Office Product and Activities	FY 2010 Request ($000)	Program Schedule					
		FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Joint Planning & Development Office							
Planning and Agency/Industry Alignment:							
Update and carry out an integrated plan for a Next Generation Air Transportation System.	693	♦	◊	◊	◊	◊	◊
Coordinate and facilitate the transfer of technologies from aeronautics research programs and direct research that will result in achieving NextGen.	272	♦	◊	◊	◊	◊	◊
Systems Integration and Transformation Analysis:							
Accomplish the coordination to create and carry out the plan to achieve more directed programs through applicable research and systems integration.	2,249	♦	◊	◊	◊	◊	◊
Develop Enterprise Architecture for systems-of systems engineering and expand lower levels of the enterprise.	2,064	♦	◊	◊	◊	◊	◊
Evaluate and validate cross IPT, integrated system-wide concepts, procedures, policies, business cases, etc. to assure potential alternatives exist that could meet all the National Plan Objectives.	2,013	♦	◊	◊	◊	◊	◊
Conduct policy analyses that focus on early decisions to establish guiding principles for the transformation	1,385	♦	◊	◊	◊	◊	◊
Model the planned system improvements to validate their efficacy in accomplishing the NextGen goals. Update roadmaps and research agenda's as required.	350	♦	◊	◊	◊	◊	◊
Assist agencies in selecting the best approaches/alternatives for transforming the current air transportation system to NextGen;	2,002	♦	◊	◊	◊	◊	◊
Conduct and report interagency budget analysis and progress	500						
Personnel and Other In-House Costs	2,879						
Total Budget Authority	14,407	14,494	14,407	14,352	14,214	14,070	13,919

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Request
A12.b.	Wake Turbulence	$10,631,000[1]

GOALS:
This program supports the following Flight Plan goal: Greater Capacity.

Intended Outcomes: The Wake Turbulence Program addresses FAA's goal for capacity and the DOT Reduced Congestion Strategic Objective to "Advance accessible, efficient, inter-modal transportation for the movement of people and goods." The program was originally focused on the near-term objectives of increasing airport capacity and the capacity of terminal airspace during by developing modifications to air traffic control wake turbulence mitigation procedures used during weather conditions requiring instrument flight procedures. During FY 2009, the program began to address the broader research agenda required to progress to the envisioned NextGen era flight operations. In FY10, the Wake Turbulence Research will continue its broader research agenda, addressing wake turbulence restrictions in today's terminal and en route airspace in the future NextGen airspace designs. Program outcomes include:

- increased NextGen capacity for more flights, and
- aircraft that are provided with more space and flight efficient separations with the same or reduced safety risk.

Agency Outputs: The Wake Turbulence Program conducts applied research to improve, in terms of flight efficiency and safety, aircraft separation processes associated with today's generalized and static air navigation service provider (ANSP) wake turbulence mitigation based separation standards. As an example, during periods of less than ideal weather and visibility conditions, implementation of an ANSP decision support tool that adjusts required wake separations based on wind conditions, would allow air traffic control to operate these airports at arrival rates closer to their visual flight rule arrival capacity. Additionally, the research program is developing wake mitigation application solutions that safely enable reduced aircraft separations in congested air corridors and during arrival and departure operations at our nation's busiest airports. The research program in FY 2010 will continue work begun in FY 2008 to address the feasibility and benefit of a wake/collision avoidance decision support capability for the flight deck.

Research Goals:

- By FY 2010, determine pilot and ANSP situational aircraft separation display concepts required for implementation of the NextGen "Trajectory Based Operation" and "High Density" concepts. [NG]
- By FY 2012, determine the NAS infrastructure requirements (ground and aircraft) for implementing the NextGen "Trajectory Based Operation" and "High Density" concepts within the constraints of aircraft generated wake vortices and aircraft collision risk. [NG]

Customer/Stakeholder Involvement: The program addresses the needs of the FAA Air Traffic Organization (ATO) and works with the agency's Aviation Safety organization to ensure new capacity efficient procedures and technology solutions are safe and that the airports and air routes targeted for their implementation are those with critical needs to reduce airport capacity constraints and air route congestion. The program works with controllers, airlines, pilots and aircraft manufacturers to include their recommendations and ensure that training and implementation issues are addressed in the program's research from the start.

Customers:

- Pilots;
- Air navigation service provider personnel;
- Air carrier operations; and
- Airport operations.

Stakeholders:

- Joint Planning and Development Office;

[1] The Wake Turbulence Program contains funding for both legacy research and NextGen research. The legacy component of this request is $3,026,000 and the NextGen component is $7,605,000

[NG] Those activities noted with the superscript NG indicate those funded with NextGen resources, while those without notation indicate those funded with the legacy program resources.

- Commercial pilot unions;
- FAA air navigation service provider unions;
- Other ICAO air navigation service providers; and
- Aircraft manufacturers.

R&D Partnerships: In addition to maintaining its partnership with the agency's Aviation Safety organization, this research program accomplishes its work via working relationships with industry, academia, and other government agencies. The coordination and tasking are accomplished through joint planning/reviews, contracts and interagency agreements with the program's partners:

- Volpe National Transportation Center [PartNG];
- Mitre/Center for Advanced Aviation and Systems Development (CAASD) [NG];
- NASA Ames and Langley Research Centers;
- EUROCONTROL and associated research organizations;
- Massachusetts Institute of Technology's Lincoln Laboratory [NG];
- National Center for Aviation Operations Research [NG];
- National Institute of Aeronautics [NG].

Accomplishments: The following represent major accomplishments of the wake turbulence program:

- FY 2008 – Developed a national air traffic control order for conducting dependent integrated landing system staggered approach operations on an airport's closely spaced parallel runways.
- FY2006-2008 - Evaluated reports of wake turbulence encounter as part of the FAA Safety Management System assurance process for changes to air traffic control procedures.
- FY 2005-2008 – Provided wake turbulence evaluation support in the integration of a new aircraft into the National Airspace System.
- FY 2004-2008 – Cooperative data exchange with European wake turbulence data collection efforts.
- FY 2002-2008 – Developed the most extensive wake turbulence transit and characterization data base in the world, used to determine feasibility of proposed changes to air traffic control's wake turbulence mitigation procedures.
- FY 2007 - Implement dependent staggered ILS approaches to St. Louis closely spaced parallel runways 12R/L and 30R/L.
- FY 2007 - Complete FAA assessment of NASA's concept for wind dependent wake turbulence mitigation procedure for aircraft arriving on closely spaced parallel runways.
- FY 2005-2007 – By analysis, simulation and evaluation prototype; demonstrated feasibility of a cross-wind based air traffic wake turbulence mitigation decision support tool concept for enabling more closely spaced departures from an airport's closely spaced parallel runways.
- FY 2006 – Provided wake turbulence information necessary for the ICAO determination of wake turbulence mitigation separations required for the A-380 aircraft.
- FY 2006 – Completed a detailed proposal for modifying the current air traffic wake turbulence mitigation procedures used for dependent staggered instrument landing system (ILS) approaches to an airport's CSPR.
- FY 2005-2006 – Enhanced the pulsed Light Detection and Ranging (LIDAR), which can measure distance, speed and rotation, for wake data collection capability, enabling it to capture wakes from both arriving and departing aircraft.
- FY 2005 – Utilizing analyses of the wake turbulence data collected at San Francisco International Airport (SFO) and Lambert – St. Louis International Airport (STL) upgraded FAA's wake turbulence encounter model used for evaluating proposed changes to air traffic control procedures for routing aircraft into and out of airports.

FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

[NG] Those activities noted with the superscript NG indicate those funded with NextGen resources, while those without notation indicate those funded with the legacy program resources.
[Part NG] Partnership with Volpe is partially funded NextGen resources and partially with legacy program resources.

- Continued wake data collection and analyses at additional airports to support airport specific changes to air traffic control procedures for dependent integrated landing system approaches to an airport's closely spaced parallel runways.
- Evaluated reports of wake turbulence encounter as part of the FAA Safety Management System assurance process for changes to air traffic control procedures.
- Completed development of the enhanced suite of wake turbulence encounter analysis tools and begin their application in the evaluation of air route changes, modifications to en route air traffic control aircraft separation procedures changes and introduction of new aircraft designs. [NG]
- Analyzed of wake turbulence data base to upgrade computational models of wake vortex transport and decay.
- Accomplished air traffic procedure/air route proposal reviews utilizing the enhanced suite of wake turbulence encounter analysis tools. [NG]
- Developed airport specific procedure modifications to enable dependent ILS approaches to closely spaced parallel runways.
- Completed development of wind prediction algorithm suitable for use in the development of a cross wind dependent wake mitigation for ground based decision support tool for approaches of 757 and "heavy" category aircraft to closely spaced parallel runways. [NG]
- Continued development of ground and aircraft based situational display concepts (joint work with EUROCONTROL) relative to separation constraints (wake, weather, and visibility) required for implementation of the NextGen concept for air routes and approach/departure paths. [NG]
- Completed program to evaluate the impact to fuel efficiency from the addition of a spiroid winglet to an aircraft's wing.

FY 2010 PROGRAM REQUEST:

In FY 2010, FAA must continue developing the capabilities needed to enable aircraft separation processes supportive of NextGen shared separation and dynamic spacing super density operations. These capabilities are highly dependent on technologies that accurately predict aircraft tracks, the track/decay of their generated wake vortices and provide this information to pilots and controllers. Some aspects of the NextGen Concept of Operations are dependent upon the aircraft being a participant in efficient, safe air traffic control processes that would minimize the effects of wake turbulence, reduce collision risk and keep traffic flowing in all weather and visibility conditions. The Wake Turbulence Program's research will result in enhanced technology assisted processes for safely mitigating aircraft wake encounter and collision risks while optimizing capacity, for all flight regimes, including the effects of weather.

KEY FY 2010 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Incorporate wake transport/decay and aircraft navigation performance analysis results into FAA wake encounter and collision risk models.
- Accomplish air traffic procedure/air route proposal reviews utilizing the enhanced suite of wake turbulence encounter and collision risk analysis tools.
- Complete two airport specific procedure modifications to enable dependent ILS approaches to closely spaced parallel runways.
- Continued data collection to determine the characteristics of wake vortices generated by departing and arriving aircraft. Data will be used in development of air navigation service provider decision support tools in reducing the required wake mitigation separation applied to airport single runway arrivals and departures. [Part NG]
- Initiate development of wake turbulence transport and decay modeling tools for use in evaluating proposed trajectory based operational concepts. [NG]
- Continue development of ground and flight deck based situational display concepts (joint work with EUROCONTROL) for showing separation constraints (driven by collision risk, wake encounter risk, weather, and visibility) for aircraft operating in NextGen air corridors and high density airspace. [NG]

[NG] Those activities noted with the superscript NG indicate those funded with NextGen resources, while those without notation indicate those funded with the legacy program resources.
[Part NG] This activity is partially funded NextGen resources and partially with legacy program resources.

- Complete development (joint work with EUROCONTROL) of analytical capability-benefit tradeoff models of potential procedures/processes/systems that would provide the desired Flight Deck capability for self separating from adjacent aircraft and their wakes. [NG]
- Initiate development of modeling tools to evaluate system-wide safety risk associated with the NextGen pair-wise separation concepts. [NG]
- Continue to conduct experiments/analyses and aviation community forums to define in terms of collision and wake encounter hazard – what is a low, major and catastrophic impact safety event and acceptable safety risk for each. [NG]
- Development of an air navigation service provider concept feasibility prototype decision support system for use in reducing required wake mitigation separations in dependent instrument landing system arrivals of B-757 and heavier aircraft on an airport's closely spaced parallel runways. [NG]

[NG] Those activities noted with the superscript NG indicate those funded with NextGen resources, while those without notation indicate those funded with the legacy program resources.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2008)	35,036
FY 2009 Enacted	10,132
FY 2010 Request	10,631
Out-Year Planning Levels (FY 2011-2014)	43,415
Total	99,214

Budget Authority ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Contracts					
Wake Turbulence	2,036	2,833	12,543	9,734	9,502
Personnel Costs	225	222	251	374	700
Other In-house Costs	12	11	19	24	110
Total	2,273	3,066	12,813	10,132	10,631

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Basic	0	0	0	0	0
Applied	2,273	3,066	12,813	10,132	10,631
Development (includes prototypes)	0	0	0	0	0
Total	2,273	3,066	12,813	10,132	10,631

A12.b.- Wake Turbulence Product and Activities	FY 2010 Request ($000)	Program Schedule					
		FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
041-150 - Wake Turbulence Legacy	2,491						
Incorporate Wake Transport/decay and aircraft navigation performance into FAA models	500	♦	◊	◊	◊	◊	◊
Continued data collection and analysis to determine the characteristics of wake vortices generated by aircraft – for enhancing the fidelity of wake models	1,191	♦	◊	◊	◊	◊	◊
Accomplish air traffic procedure/air route proposal reviews for wake turbulence impacts	300	♦	◊	◊	◊	◊	◊
Develop airport specific procedure modifications to enable dependent ILS approaches to closely spaced parallel runways	500	♦	◊	◊	◊		
Evaluate the fuel efficiency impact from addition of a spiroid winglet to an aircraft's wing	0	♦					
111-130 - Wake Turbulence NextGen	7,330						
Development of enhanced analysis tools for evaluating wake encounter and collision risk resulting from the design of airspace efficient routes, air traffic procedure changes, and the introduction of new aircraft designs [NG]	600	♦	◊	◊			
Continued data collection and analysis to determine the characteristics of wake vortices generated by aircraft – for use in determining potential achievable separation reduction in single runway operations [NG]	800	♦	◊	◊	◊	◊	
Development of modeling and other analysis tools required for evaluation of wake encounter risks of trajectory based operations [NG]	300		◊	◊	◊		
Accomplish wake turbulence and collision risk assessments of potential air traffic routing and separation changes associated with evolution to NextGen [NG]	800	♦	◊	◊	◊	◊	◊
Development of ground based and flight deck based situational display concepts for showing separation constraints for aircraft operating in NextGen air corridors and high density airspace	1,400	♦	◊	◊	◊	◊	◊
Development of analytical capability-benefit tradeoff models of potential procedures/ processes/systems that would provide the desired Flight Deck capability for self separating from adjacent aircraft and their wakes [NG]	600	♦	◊	◊	◊	◊	
Conduct experiments/analyses and aviation community forums to define in terms of allowable safety risk for potential results from wake encounter or blunder in aircraft navigation [NG]	830	♦	◊	◊	◊	◊	◊
Complete development of ANSP prototype decision support system for use in reducing required wake mitigation separations in dependent instrument landing system arrivals of 757 and heavier aircraft on an airport's closely spaced parallel runways [NG]	1,500	♦	◊				
Develop an approach and associated modeling tools to evaluate system-wide safety risk for NextGen era reduced separation standards [NG]	500	♦	◊	◊	◊		
Personnel and Other In-House Costs	810						
Total Budget Authority	10,631	10,132	10,631	10,750	10,842	10,932	10891

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process. The Wake Turbulence BLI contains both Legacy and NextGen program data.

[NG] Those activities noted with the superscript NG indicate those funded with NextGen resources, while those without notation indicate those funded with the legacy program resources.

Budget Item	Program Title	Budget Request
A12.d.	NextGen – Air Ground Integration Human Factors	$5,688,000

GOALS:
This program supports the following Flight Plan goals: Increased Safety, Greater Capacity, International Leadership, and Organizational Excellence.

Intended Outcomes: By 2017, demonstrate that NextGen operations, procedures and information can be standard and predictable for users (e.g., pilots, controllers, airlines, passengers) at all types of airports and for all aircraft across the full range of environmental conditions.

Integration of air and ground capabilities poses challenges for pilots and air traffic service providers. A core human factors issue is ensuring the right information is provided to the right human operators at the right time to make the right decisions. Transitions of increasingly sophisticated automation and procedures must be accompanied by supporting interoperability with baseline systems and refinement of procedures to ensure efficient operations and mitigate potential automation surprises. Additionally, NextGen systems, procedures and training must support safe and effective planned and unexpected transitions between NextGen and legacy airspace procedures.

The safety factors that primarily have an impact on separation assurance must be jointly approached by both the flight deck and air traffic research communities. The increased levels of automation and new enabling technologies that will likely transform the National Airspace System (NAS) in the future will bring new human factors challenges. As the NAS moves toward a more automated system and roles and responsibilities change in a series of planned steps, intent information as well as positive information on delegation of authority must be clear and unambiguous. This changing environment requires a close examination of new types of human error modes to manage safety risk in the human factors domain. Equipment design methods, training, and procedures must be developed to decrease error likelihood and/or increase timely error detection, for example in the case of blunders on closely spaced parallel approaches.

Many of the emerging NextGen concepts imply that a flight plan will become an air-ground performance contract that meets the user's needs, will be executed by the flight deck, and protected by the air traffic service provider. There are multiple parameters in aviation such as weather, unanticipated traffic, sudden denial of airspace or airport assets, emergencies, and a myriad of other factors that will require close monitoring to meet the expected flight performance goals.

Changes in roles and responsibilities will occur not only between pilots and air traffic service providers, but also for both groups and the respective automation they use to achieve NextGen safety and efficiency gains. Issues such as mode confusion, transitions, and reversions must be understood and addressed to ensure appropriate levels of situation awareness and workload are maintained.

The NextGen environment will include an increased reliance on collaborative and distributed decision making. Information must be provided to participants, e.g., pilots, air traffic service providers and airline operation centers in a fashion that facilitates a shared understanding of phenomena, such as weather, wake, etc. The format, content, timeliness and presentation of that information must be well integrated with other information provided to decision makers and their decision support tools.

Operational Improvements (OIs) to be addressed from an integrated air-ground perspective include provision for spacing, merging and passing in en route airspace via Cockpit Display of Traffic Information (CDTI) and Automatic Dependent Surveillance - Broadcast (ADS-B), with procedures for less than current levels of aircraft separation. Lateral and in-trail separation would be reduced to near Visual Flight Rules (VFR) levels for single runway and for converging and closely spaced parallel runway operations using CDTI, ADS-B and wake vortex ground detection. Aircraft-to-aircraft separation would be delegated to the flight deck in oceanic airspace, with reduced longitudinal and lateral spacing via Required Navigation Performance (RNP), ADS-B/CDTI and data communication.

Agency Outputs: The NextGen Air-Ground Integration research program addresses flight deck - air traffic service provider integration for each operational improvement or NextGen application considered, with a focus on those issues that primarily affect the pilot side of the air-ground integration challenge. The program collaborates with the NextGen Self Separation Human Factors Program to ensure robust examination of NextGen human factors issues. Through use of modeling, simulation, and demonstration, the program assesses interoperability of tools, develops design guidance, determines training requirements, and verifies procedures for ensuring safe, efficient and effective human system integration in transitions of NextGen capabilities.

Outputs include:

- Defining, understanding, and developing guidance to successfully implement the changes in roles and responsibilities between pilots and controllers, and between humans and automation required for NextGen capabilities and applications.
- Defining human and system performance requirements and guidance for the design and operation of aircraft and air traffic management systems to include examination of information needs, human capabilities, interface design and systems integration issues.
- Developing and applying risk and error management strategies, mitigating risk factors, and reducing human errors.

Research Goals: Research will support development of policy, standards and guidance required to design, certify and operate NextGen equipment and procedures from the perspective of air-ground integration. Additionally, this research will conduct integrated demonstrations of NextGen procedures and equipment in the context of ongoing air-ground integration human factors research.

- By 2016 complete research to enable safe and effective changes to pilot and ATC roles and responsibilities for NextGen procedures.
  - By 2011 develop initial taxonomy describing the relationship between pilots/ATC and associated automated systems.
  - By 2012 complete initial research to evaluate and recommend pilot-ATC procedures for negotiations and shared decision making NextGen activities.
  - By 2015 complete research to identify and recommend mitigation strategies to address potential coordination issues between humans and automated systems.
  - By 2016 complete research to identify methods for effectively allocating functions between pilots/ATC and automated systems as well as mitigating any losses of skill associated with these new roles and responsibilities.
- By 2016 complete research to identify and manage the risks posed by new and altered human error modes in the use of NextGen procedures and equipment.
  - By 2011 initiate development of guidance to support certification personnel in assessing suitability of design methods to support human error detection and correction.
  - By 2012 complete initial research investigating methods to mitigate mode errors in use of NextGen equipment.
  - By 2014 develop initial guidance on training methods to support detection and correction of human errors in near to mid-term NextGen procedures.
  - By 2016 complete research and modeling activities to identify, quantify and mitigate potential human errors in the use of NextGen equipment and procedures.
- By 2016 complete research on human systems integration issues related to information needs, human capabilities and limitations, interface design and system integration required to support effective guidance for NextGen equipment design, procedure development and personnel training.
  - By 2010 initiate research to identify equipment categories for legacy flight deck avionics to support human factors evaluations of use of these systems in NextGen flight procedures.
  - By 2010 complete initial simulation and demonstration roadmap to support future research and integrated demonstrations.
  - By 2010 initiate research to identify human factors issues associated with instrument procedure design and use to support development of human factors guidelines for instrument procedures.
  - By 2012 initiate research to assess pilot performance in normal and non-normal NextGen procedures, including single pilot operations.

- By 2013 complete initial research to identify cognitive tasks, associated information needs and recommended display methods for tasks that require shared flight deck-ATC information.
- By 2013 complete initial research to address human-automation integration issues regarding the certification of pilots, procedures, training and equipment necessary to achieve NextGen capabilities.
- By 2013 complete research to identify human factors issues and potential mitigation strategies for the use of legacy avionics in NextGen procedures.
- By 2014 complete research to provide initial recommendations for equipment design, procedures and training to support use of 2 ½ to 4 D trajectories.
- By 2014 complete initial research to provide recommendations for displays, alerts, procedures and training associated with data communications.
- By 2016 complete research to assess procedures, training, display and alerting requirements to support development and evaluation of planned and unplanned transitions between NextGen and legacy airspace procedures.

Customer/Stakeholder Involvement: Program researchers work directly with colleagues in FAA, other government agencies, academia, and industry to support the following R&D programs and initiatives:

- Guidance from the Joint Planning and Development Office (JPDO) Next Generation Air Transportation System (NextGen) initiative.
- NASA's Aviation Safety and Airspace Programs.
- Close collaboration with FAA organizations, notably Flight Standards and Aircraft Certification in the AVS line of business.
- Collaboration with specific FAA programs such as the Surveillance and Broadcast Services (SBS), DataComm and the NextGen-Wake programs.
- FAA Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review the activities of the program and provide advice on priorities and budget.

R&D Partnerships: The NextGen Air-Ground Integration research program collaborates with industry and other government programs through:

- Collaborative research with NASA on its safety, airspace and air portal projects includes the identification of human factors research issues in the NextGen as technology brings changes to aircraft capabilities.
- Complex full mission demonstrations using a distributed simulation architecture will leverage NASA cockpit and Air Traffic Management (ATM) simulation facilities and other resources.
- Cooperative research agreements will be used with universities to address NextGen human factors issues.
- Coordination on research issues and plans with aircraft and avionics manufacturers and operators as well as international civil aeronautics authorities.

FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Roles and Responsibilities

- Initiated development of a standard taxonomy for describing the relationship between flight deck and Air Traffic Control (ATC) automated systems and human operators in the context of NextGen equipment and applications.
- Initiated investigation of shared decision making methods considering potential decisions shared between flight deck, Air Navigation Service Provider (ANSP) and Aircraft Operations Center (AOC) personnel.

Human System Integration

- Developed initial concepts for cockpit and ATC displays of time domain information to support 2 ½ to 4D trajectory information.

- Began research to identify impact of data communications on flight deck information needs and shared situation awareness.
- Initiated research to investigate issues associated with single pilot aircraft in NextGen procedures.
- Established preliminary equipment categories for legacy Flight Management Systems and associated cockpit displays to support future human factors evaluations of the acceptability of using legacy avionics equipment in NextGen procedures.
- Began work to identify standard methods for conducting task analyses of flight deck-ATC activities for NextGen airspace procedures.
- Initiated research to identify human factors issues associated with instrument procedure design and use.

Error Management

- Initiated development of structured method to assist certification personnel in identifying risk areas related to human error and assessing system resilience to error for new and modified systems and procedures.
- Began assessment of nature and impact of potential errors in oceanic in trail procedures.

Integrated Demonstrations

- Developed an initial simulation and demonstration roadmap laying out incremental objectives, simulation requirements, assumptions, and risks.

FY 2010 PROGRAM REQUEST:

The program will assess human system integration issues in use of airborne NextGen concepts, capabilities, and procedures, and ATM leading to a full mission demonstration. Each of these research areas, although general in nature, will be conducted in the context of specific near to mid-term NextGen applications such as closely spaced parallel operations, oceanic in-trail procedures, etc.

Roles and Responsibilities

- Assess the impact of function allocation, human-automated system coordination, negotiation procedures and interface design on flight deck and ANSP performance.

Human System Integration – Information Needs

- Identify flight deck and ATC information needs, display and alerting methods to support NextGen shared information requirements.
- Identify human factors issues associated with instrument procedure design and use to support development of human factors guidelines for instrument procedures.

Human System Integration – Human Capabilities and Limitations

- Assess pilot performance in normal and non-normal situations for NextGen operational procedures.

Human System Integration – System Integration

- Assess human factors issues associated with the use of legacy avionics in NextGen procedures.
- Evaluate display and alerting requirements as well as information needs associated with data communications.

Risk and Error Management

- Develop methods to identify and mitigate human error pathways in the use of NextGen equipment and procedures.

KEY FY 2010 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Roles and Responsibilities

- Develop initial guidance addressing allocation of functions between the aircrew and automation.
- Develop initial guidance on procedures for flight deck-ANSP negotiations.

Human System Integration – Information Needs

- Develop initial guidance for the design of NextGen flight deck and ATC displays and alerts, including those required for oceanic in trail procedures.
- Continue research to identify human factors issues associated with instrument procedure design and begin development of human factors guidelines for instrument procedures.

Human System Integration – Human Capabilities and Limitations

- Develop methodology to address the human capabilities and limitations of pilots (including single-pilot aircraft) to conduct a range of NextGen airspace procedures in normal and non-normal situations.
- Evaluate flight technical error in all four dimensions for TBO.

Human System Integration – System Integration

- Identify the human factors issues associated with use of legacy avionics on near-term NextGen procedures and provide recommended mitigation strategies where appropriate.
- Conduct research to support guidance for data communications procedures, training, displays and alerts.
- Assess information needs, displays, alerts, procedures and training associated with oceanic in trail procedures.

Risk and Error Management

- Deliver initial results of proactive analyses of human error hazards to understand and predict human error vulnerabilities.
- Assess human error impact and mitigation in oceanic in trail procedures and RNP operations.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2008)	0
FY 2009 Enacted	2,554
FY 2010 Request	5,688
Out-Year Planning Levels (FY 2011-2014)	46,308
Total	$54,550

Budget Authority ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Contracts:					
NextGen - Air Ground Integration Human Factors	0	0	0	2,485	5,348
Personnel Costs	0	0	0	69	239
Other In-house Costs	0	0	0	0	0
Total	0	0	0	2,554	5,688

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Basic	0	0	0	0	0
Applied	0	0	0	2,554	5,687
Development (includes prototypes)	0	0	0	0	0
Total	0	0	0	2,554	5,688

A12.d. – NextGen Air - Ground Integration Human Factors	FY 2010 Request ($000)	Program Schedule					
		FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
111-110 NextGen Air-Ground Integration							
Roles and Responsibilities	603						
Assess methods of allocating functions and structuring the coordination between pilots/controllers and automated systems,				◊	◊	◊	
Develop certification guidance for new methods of automating flight tasks based on observed strengths and weakness					◊	◊	◊
Identify design and procedural methods to support collaboration and negotiation between flight deck, ANSP and AOC personnel			◊	◊	◊	◊	◊
Assess skill loss and mitigation strategies associated with NextGen changes in pilot roles and responsibilities				◊	◊	◊	◊
Human System Integration	3,333						
Information Needs							
Identify flight deck and ATC information needs, display and alerting methods to support NextGen shared information requirements.			◊	◊	◊	◊	◊
Identify human factors issues associated with instrument procedure design and use to support development of human factors guidelines for instrument procedure design.		♦	◊	◊	◊	◊	◊
Human Capabilities and Limitations							
Assess pilot performance in normal and non-normal situations for NextGen operational procedures, including single pilot operations		♦	◊	◊	◊	◊	
Identify human capabilities and limitations for pilot/ANSP/AOC shared decision-making, and provide recommended mitigation strategies to address identified risks			◊	◊	◊	◊	◊
Interface Design							
Develop design guidance to support display of shared information considering user needs and relevant information properties, including requirements for location in the forward field of view		♦	◊	◊	◊	◊	◊
Develop design and procedural guidance to support dissemination, entry and evaluation of 2 ½ to 4D clearances via data communications				◊	◊	◊	◊
System Integration							
Develop training standards and procedures to support NextGen operations and associated transitions in normal and non-normal conditions				◊	◊	◊	◊
Assess human factors issues associated with use of legacy avionics in NextGen procedures		♦	◊	◊	◊	◊	◊
Risk and Error Management	1,112						
Provide interface design guidance to support error detection, identification and correction				◊	◊	◊	◊
Develop training and procedural requirements to support error detection and correction in NextGen procedures to include oceanic in trail procedures			◊	◊	◊	◊	◊
Develop guidance to support certification personnel in evaluating risks and mitigation of human error and potential unintended uses of new technology in NextGen systems and procedures			◊	◊	◊		
Integrated Demonstrations	400						
Develop simulation roadmap		♦	◊				
Demonstrate pilot and controller functional capabilities via simulation (specific demonstrations executed under activities listed above)				◊	◊	◊	◊
Personnel and Other In-House Costs	239	◊	◊	◊			
Total Budget Authority	5,688	2,554	5,688	11,355	11,536	11,716	11,701

Notes: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A12.e.	NextGen – Self-Separation Human Factors	$8,247,000

GOALS:
This program supports the following Flight Plan goals: Increased Safety, Greater Capacity, and International Leadership.

Intended Outcomes: By 2016, develop initial standards and procedures to enhance spacing of aircraft using Next Generation Air Transportation System (NextGen) capabilities. In the near term, this includes reduced aircraft separation and delegated separation.

New technologies such as Global Positioning System (GPS), Automatic Dependent Surveillance-Broadcast (ADS-B), and Cockpit Display of Traffic Information (CDTI) afford the possibility of transitioning from classic air traffic control separation assurance procedures to aircraft based spacing and separation. In the near to mid-term, these procedures will focus on reduced and delegated separation as well as supporting runway/surface awareness. Many NextGen enhanced capabilities are based on various aircraft oriented activities such as spacing, merging, passing, and closely spaced parallel operations, etc. Research will assess the human factors risks and requirements associated with these various spacing policies, procedures and maneuvers. The research results will provide technical information to support the development of standards, procedures, and training by Flight Standards to implement NextGen. Human factors research required to provide the scientific and technical information to address human performance issues include:

- Providing human factors assessments on new information requirements to allow pilots to safely maintain aircraft separation, especially during low visibility ground operations.
- Providing robust assessments of reduced separation procedures to ensure non-normal and emergency operations are evaluated including system failures and reversion impacts. The NextGen benefits associated with reduced aircraft spacing in high density terminal airspace also leave fewer buffers to accommodate non-normal events. The impact on safety and efficiency will be addressed.
- Understanding changing roles and responsibilities associated with shifting separation responsibility between pilot and controller during delegated separation operations.
- Developing advanced methods including efficient and standardized procedures to certify pilots and automation for different separation operations.
- Assessing risk of pilot error during reduced and delegated aircraft spacing operations as NextGen technologies and procedures are implemented and integrated with legacy avionics.
- Providing requirements and guidance for training pilots to assure adequate understanding of automation functions and limitations as they apply to enhanced spacing and separation operations.

Agency Outputs: The NextGen – Self Separation Human Factors Research Program develops human factors scientific and technical information to address human performance and coordination among pilots and air navigation service providers (air traffic controllers), human system integration, and error management strategies to implement NextGen capabilities. Human factors technical information will also support the development of standards, procedures, training, policy, and other guidance material required to implement the operational improvements leading to enhanced aircraft spacing and separation.

Outputs include:

- Define the potential impact and human factors issues of new technologies such as enhanced vision, synthetic vision, and electronic flight bags on separation activities.
- Define human factors technical information needed to support the development of standards, procedures, and training by Flight Standards to implement plans for reduced aircraft separation and recovery to classic air traffic operations as a result of abnormal events.
- Develop procedures and training needed to implement new roles and responsibilities for pilots and controllers during delegated separation operations.
- Define human and system performance requirements for separation activities, e.g., spacing, merging, and passing.
- Develop and apply error management strategies, mitigate risk factors, and reduce automation-related errors associated with enhanced separation operations.

- Develop human factors criteria for the successful use of flight deck performance monitoring and decision support tools as they relate to enhanced separation maneuvers such as spacing, merging, and passing, and how conformance alerts are communicated and resolved between flight deck and ground monitors, for example in Area Navigation (RNAV)/Required Navigation Performance (RNP) approach and departure operations.

Research Goals: Conduct R&D to support the development of standards, procedures, training, policy, and other guidance material required to implement the NextGen operational improvements leading to enhanced aircraft spacing and separation including improved awareness of surface/runway operations, reduced separation, and delegated separation.

- By 2016, complete research to enable enhanced aircraft spacing for surface movements in low visibility conditions guided by enhanced and synthetic vision systems, as well as cockpit displays of aircraft and ground vehicles and associated procedures.
  - By 2010 identify the major human factors considerations requiring research to support evaluation and recommendation of minimum display standards for use of enhanced and synthetic vision systems, as well as airport markings and signage, to conduct surface movements across a range of visibility conditions.
  - By 2012 complete initial research to evaluate and recommend minimum display standards for use of enhanced and synthetic vision systems, as well as airport markings and signage, to conduct surface movements across a range of visibility conditions.
  - By 2014 evaluate and recommend minimum display standards and operational procedures for use of CDTI to support pilot awareness of potential ground conflicts and to support transition between taxi, takeoff and departure phases of flight.
  - By 2016 complete research to identify human capabilities and limitations with respect to ground collision avoidance and identify potential design solutions, training and procedures to mitigate risks associated with human performance.
- By 2015, complete research and provide human factors guidance to reduce arrival and departure spacing including variable separation in a mixed equipage environment.
  - By 2011 complete initial research to evaluate the impact and potential risks associated with use of Traffic Alert and Collision Avoidance System (TCAS) in NextGen procedures.
  - By 2012 initiate research to evaluate alternative methods of allocating functions and coordinating between automated systems, pilots, Air Traffic Control (ATC) and Airline Operations Center (AOC) personnel in reduced and delegated separation procedures.
  - By 2014 complete research to identify likely human error modes and recommend mitigation strategies in closely spaced arrival/departure routings, including closely spaced parallel operations.
  - By 2015 complete initial research on human performance considerations for design, training and operational procedures in conformance monitoring and detection/correction of nonconformance with reduced separation routings and procedures.
- By 2015, enable reduced and delegated separation in oceanic airspace and high density en route corridors.
  - By 2010 develop initial methodology for conducting robust systematic assessments of separation procedures to ensure non-normal and emergency operations are evaluated.
  - By 2011, complete research to evaluate and recommend procedures, equipage and training to safely conduct oceanic and en route pair-wise delegated separation.
  - By 2013 complete initial research to provide recommended guidance for design of cockpit displays and alerts to support delegated separation.
  - By 2015 complete research to support recommended procedures and training required to safely and efficiently transition to/from NextGen reduced and delegated separation procedures in normal and non-normal conditions.
- By 2015, develop a repository of NextGen human factors data containing research roadmaps, results, and data from relevant ongoing and historical research, demonstrations and operational

experience to provide a foundation for flight deck human factors research to support policy decisions, standards development, certification and approval to enable NextGen operational improvements, and to ensure that the future system adequately considers human systems integration issues.

Customer/Stakeholder Involvement: Program researchers work directly with colleagues in FAA, other government agencies, academia, and industry to support the following R&D programs and initiatives:

- Guidance from the Joint Planning and Development Office (JPDO) NextGen initiative.
- NASA's Aviation Safety and Airspace Programs.
- Close collaboration with FAA organizations, notably Flight Standards and Aircraft Certification in the AVS line of business.
- Collaboration with specific FAA Programs such as the Surveillance and Broadcast Services (SBS), DataComm and the NextGen-Wake programs.
- Collaboration with specific FAA Programs such as the Surveillance and Broadcast Services (SBS), DataComm and the NextGen-Wake programs.
- FAA Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review the activities of the program and provide advice on priorities and budget.

R&D Partnerships: The research program collaborates with industry and other government programs through:

- Collaborative research with NASA on its aviation safety and airspace projects includes the identification of human factors research issues in the NextGen as technology brings changes to aircraft capabilities. Complex full mission simulations using an aviation simnet distributed simulation architecture will leverage NASA cockpit and Air Traffic Management (ATM) simulation facilities and other resources.
- Cooperative research agreements will be used with universities to address NextGen human factors issues.
- Coordination on research issues and plans with aircraft and avionics manufacturers and operators.
- Coordination will occur with appropriate RTCA Committees, e.g., Airborne Separation Assurance System.

FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Surface/Runway Operations Awareness

- Began to define pilot information requirements for the display and use of enhanced cockpit technologies (Enhanced Flight Vision Systems (EFVS)/Synthetic Vision Systems (SVS), TCAS, and CDTI to support all-weather operations.
- Initiated development of survey instruments and analysis techniques to evaluate airport signage and lighting effects on pilot navigation at night and in reduced visibility.

Reduced Separation

- Began to evaluate pilot conformance, conflict detection and avoidance capabilities, and recommend pilot training and performance standards to ensure safe separation.
- Began to develop recommendations for use of autopilot coupled collision avoidance and pilot procedures for overriding the automation in each flight phase.
- For closely spaced parallel operations, began research to determine CDTI and information requirements to support dual missed approaches, and to evaluate controller and flight crew workload and effects of blunder during the missed approach.

Delegated Separation

- For near to mid-term delegated separation procedures and applications for single-pilot operations, began to assess the impact of systems failures to prepare for development of procedures to safely and efficiently revert to backup separation methods.

- For oceanic pair-wise separation procedures, began to determine information needs, time requirements and pilot accuracy for detection and resolution of potential conflicts.
- Began to evaluate ADS-B/CDTI displays and procedures in a robust evaluation of merging and spacing operations for a range of controller-specified spacing and a variety of aircraft (not all same carrier or aircraft type).
- Began assessment of human factors issues for the design and pilot use of display technologies including CDTI and TCAS in delegated separation operations.

Cross-cutting

- Began planning for robust assessments of separation procedures to ensure non-normal and emergency operations are evaluated including system failures and reversion impacts.
- Initiated needs assessment for pilot training use of automation in NextGen separation operations.
- Began to develop risk and error management strategies to identify and mitigate human-system errors with use of advanced cockpit automation for navigation, conformance monitoring and decision-making during various NextGen operations.
- Began human factors assessments of new information requirements for NextGen alerts and displays in reduced and delegated separation operations.
- Initiated examination to identify potential uses of TCAS equipment and symbology in reduced and delegated separation operations.
- Began to determine the expected nature, frequency and potential impact of instrument procedure design on pilot errors.
- Contributing to the development of a repository of NextGen human factors data, began a survey of human factors research relevant to near-to-mid-term NextGen applications, and a survey of the human factors issues that have arisen through operational experience with systems and procedures relevant to near to mid-term NextGen applications, as well as the projected needs based on NextGen planning documents.

FY 2010 PROGRAM REQUEST:

The program will assess human system integration issues in use of airborne NextGen concepts, capabilities, and procedures, and Air Traffic Management (ATM) leading to a full mission simulation in 2016.

Surface/Runway Operations Awareness

- Evaluate all-weather ground movement area and runway operations using enhanced cockpit technologies, including EFVS)/SVS, TCAS, and CDTI.
- Assess contributions of airport signage and lighting on ground operations at night and in low-visibility weather conditions.

Reduced Separation

- Assess changing roles and responsibilities associated with shifting separation responsibility between pilot and controller under different operational separation situations.
- Evaluate pilot performance in reduced separation operations, such as closely spaced parallel operations, and develop pilot training and performance standards to ensure flight safety.

Delegated Separation

- Provide guidance for training pilots to assure adequate understanding of automation functions and display limitations as they apply to separation operations using CDTI and TCAS.
- For near to mid-term delegated separation procedures and applications for single-pilot operations, continue assessing the impact of systems failures and begin development of procedures to safely and efficiently revert to backup separation methods.
- For oceanic pair-wise separation procedures, determine information needs, time requirements and pilot accuracy for detection and resolution of potential conflicts.
- Conduct research efforts to evaluate ADS-B/CDTI displays and procedures in a human-in-the-loop (HITL) simulation of merging and spacing operations.

Cross-cutting

- Provide robust assessments of separation procedures to ensure non-normal and emergency operations are evaluated including system failures and reversion impacts.

- Provide initial guidance for the integration of CDTI and TCAS symbology.
- Develop advanced methods including efficient and standardized procedures to certify pilots and automation for different separation operations.
- Determine the expected nature, frequency and potential impact of instrument procedure design on pilot errors.
- Conduct a gap analysis that will identify major human factors research needs for NextGen, by comparing results of completed research and operations data with projected requirements for human performance in future NextGen applications.

KEY FY 2010 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Surface/Runway Operations Awareness

- Continue study to define pilot information display requirements for use of enhanced cockpit technologies, including EFVS/SVS, TCAS, and CDTI to support all-weather operations.
- Evaluate airport signage and lighting effects on pilot navigation at night and reduced visibility.

Reduced Separation

- Evaluate pilot conformance, conflict detection and avoidance capabilities, and recommend pilot training and performance standards to ensure safe separation.
- Develop recommendations for use of autopilot coupled collision avoidance and pilot procedures for overriding the automation in each flight phase.
- For closely spaced parallel operations, continue research to determine CDTI requirements to support dual missed approaches, and to evaluate controller and flight crew workload and effects of blunder during the missed approach.

Delegated Separation

- Continue analysis to evaluate pilot training requirements for use of limited delegation of separation authority in the oceanic environment.
- Develop recommendations for the design and use of display technologies by pilots, including CDTI and TCAS in delegated separation operations.
- For near to mid-term delegated separation procedures and applications for single-pilot operations, continue assessing the impact of systems failures and begin development of procedures to safely and efficiently revert to backup separation methods.
- For oceanic pair-wise separation procedures, continue to determine information needs, time requirements and pilot accuracy for detection and resolution of potential conflicts.
- Continue to evaluate ADS-B/CDTI displays and procedures in a full evaluation of merging and spacing operations for a range of controller-specified spacing and a variety of aircraft (not all same carrier or aircraft type).

Cross-cutting

- Continue robust assessments of separation procedures to ensure non-normal and emergency operations are evaluated including system failures and reversion impacts.
- Provide guidance for training pilots to use automation in NextGen separation operations.
- Provide human factors assessments of new information requirements for NextGen alerts and displays in reduced and delegated separation operations.
- Provide guidance for the integration and use of TCAS equipment and symbology in reduced and delegated separation operations.

- Continue to determine the expected nature, frequency and potential impact of instrument procedure design on pilot errors.
- Continue development of a repository of NextGen human factors data, incorporating results of efforts to survey human factors research relevant to near-to-mid-term NextGen applications, and surveys of the human factors issues that have arisen through operational experience with systems and procedures relevant to near to mid-term NextGen applications, as well as the projected needs based on NextGen planning documents.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2008)	0
FY 2009 Appropriated	8,025
FY 2010 Request	8,247
Out-Year Planning Levels (FY 2011-2015)	41,140
Total	57,412

Budget Authority ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Contracts:					
NextGen - Self Separation Human	0	0	0	7,956	7,796
Personnel Costs	0	0	0	69	451
Other In-house Costs	0	0	0	0	0
Total	0	0	0	8,025	8,247

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Basic	0	0	0	0	0
Applied	0	0	0	8,025	8,247
Development (includes prototypes)	0	0	0	0	0
Total	0	0	0	8,025	8,247

A12.e. – NextGen – Self-Separation Human Factors	FY 2010 Request	Program Schedule					
Product and Activities	($000)	2009	2010	2011	2012	2013	2014
111-120 NextGen – Self Separation							
Surface/Runway Operations Awareness	1,403						
For aircraft operations in all weather conditions (including low visibility conditions and at night), Define pilot information display requirements and develop recommendations for policy and safe operating procedures for use of enhanced and synthetic vision systems		♦	◊	◊	◊	◊	◊
Develop requirements for alerts, CDTI and pilot performance for low visibility ground operations		♦	◊	◊	◊	◊	◊
Evaluate airport signage and lighting effects on pilot navigation performance in aircraft movement areas		♦	◊	◊	◊	◊	◊
Reduced Separation	2,339						
For closely spaced parallel operations, determine CDTI requirements to support dual missed approaches, and evaluate controller and flight crew workload and effects of blunder during the missed approach.		♦	◊	◊	◊	◊	◊
For aircraft operations in a reduced separation environment (3 miles or less everywhere), Evaluate pilot conformance, conflict detection and avoidance capabilities, and recommend pilot training and performance standards to ensure safe separation		♦	◊	◊	◊	◊	◊
Develop recommendations for use of autopilot coupled collision avoidance and pilot procedures for overriding the automation in each flight phase		♦	◊	◊	◊	◊	◊
Delegated Separation	3,196						
For near to mid-term delegated separation procedures and applications for single-pilot operations, assess the impact of systems failures and begin development of procedures to safely and efficiently revert to backup separation methods.		♦	◊	◊	◊	◊	◊
For oceanic pair-wise separation procedures, determine information needs, time requirements and pilot accuracy for detection and resolution of potential conflicts.		♦	◊	◊	◊	◊	◊
For specific transient situations in which separation responsibility is delegated to the pilot, such as climb-in-trail passing, Evaluate pilot training requirements for use of limited delegation of separation authority in the oceanic environment.		♦	◊	◊	◊	◊	◊
Develop recommendations for pilot use of display technologies including CDTI and TCAS to designate the reference aircraft and to maintain separation		♦	◊	◊	◊	◊	◊
Cross-Cutting	858						
Provide guidance for training pilots to use automation in NextGen separation operations		♦	◊	◊	◊	◊	◊
Develop risk and error management strategies to identify and mitigate human-system errors				◊	◊	◊	◊
Provide human factors assessments of new information requirements		♦	◊	◊	◊	◊	
Provide guidance for the integration TCAS symbology into CDTI		♦	◊	◊	◊	◊	◊
Determine the expected nature, frequency and potential impact of instrument procedure design on pilot errors.		♦	◊	◊	◊	◊	◊
Personnel and Other In-House Costs	451						
Total Budget Authority	8,247	8,025	8,247	10,076	10,243	10,411	10,410

Notes: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A12.f.	NextGen – Weather Technology in the Cockpit	$9,570,000

GOALS:
This program supports the following Flight Plan goals: Increased Safety and Greater Capacity.

Intended Outcomes: By 2015, demonstrate that technology and automation, combined with policy, procedures, and regulatory oversight, meets the Next Generation Air Transportation System (NextGen) goal of reducing weather delays leading to more efficient air traffic management (ATM) and improving aviation safety. Demonstrations will show that the technology and automation used in the cockpit provides pilots and aircrews with common weather situation awareness for safety and traffic flow management and assists airborne decision-making (e.g., adverse weather avoidance, etc.) by providing realistic, practical solutions to issues involving a myriad of variables.

The NextGen Concept of Operations (ConOps) requires technology and automation in the cockpit to produce a "common weather picture" that will enhance collaborative decision-making and improve the safety, capacity, and efficiency of air transportation system by identifying the safest and most efficient route for aircraft traversing areas impacted by adverse weather conditions. The germane characteristics of the technology generally identified in the NextGen ConOps are that it assists collaborative decision-making (pilot, controller, air traffic management, etc.), leverages both human and automation capabilities, and integrates weather data and information with other necessary operational information to provide decision support and increase situational awareness. In the near term, this technology will be implemented as machine to human interface requiring human analysis and "processing" of visual presentations. However, in the long-term, the technology and automation envisioned in the NextGen ConOps is expected to migrate to automated "processing" via machine-to-machine interface between ground-based and aircraft systems (e.g., analyzes and processing of data and information are performed automatically and recommendations are provided to the human overseeing the aircraft operation). As a result, the NextGen ConOps differs dramatically from current operations regarding weather procedures; therefore, an examination of the NextGen goals and related procedures is warranted.

Agency Outputs: One of the weather-related goals of NextGen is to reduce weather delays allowing more efficient and flexible air traffic management. The objective of the Weather Technology in the Cockpit program is to enable flight deck weather information technologies that will provide flight crews with timely, comprehensive weather information from on-board sensors, cross-link from nearby aircraft, and up-link from ground-based processors to support flight re-planning and weather hazard avoidance in flight, as well as in-situ observations to nearby aircraft for weather avoidance decisions and ground-based processors for direct and forecast use in ATM decision support processes.

The program will be accomplished through the successful completion of research in the following areas:

- Requirements Development – Develop a comprehensive user information needs statement and concept of operations for utilizing weather information in cockpit decision making based on the NextGen Concept of Operations.
- Technology Assessment – Assess currently available onboard weather information processors, cockpit/ground interface capabilities, and communications infrastructure, identify gaps, and identify emerging technological capabilities to address the gaps.
- Proof of Concept Demonstration – Simulate and evaluate currently available systems for providing weather information to the cockpit.
- Weather Technology in the Cockpit Prototype – Develop prototypes of weather information integration modules for flight deck technologies (e.g., flight management systems (FMS), electronic flight bags (EFB), etc.), perform full, mission demonstrations, and assess the integration of navigation, flight, and weather information into cockpit decision-making processes.
- Policy, Standards, and Requirements – Develop standards and guidance necessary to obtain design approvals for weather decision support systems for use in the cockpit, define minimum pilot training requirements, develop procedures for weather separation on the flight deck, and recommend changes to FAA and international policies pertaining to the provision and utilization of weather information in the cockpit.

Research Goals: Research will enable the development of policy, standards, and guidance needed to safely implement weather technologies in the cockpit to provide shared situational awareness and shared responsibilities. The goals of the research are:

- By FY 2013, develop prototype weather information integration modules for flight deck technologies (e.g., FMS, EFB, etc.).
- By FY 2014, simulate, test, and evaluate cockpit use of weather decision support tools, including probabilistic forecasts.
- By FY 2014, simulate test, and evaluate fully integrated cockpit use of NextGen operational concepts, including weather technology in the cockpit.
- By FY 2014, support full mission demonstrations assessing weather information integrated in NextGen air and ground capabilities for controllers and pilots.
- By FY 2014, complete research necessary to develop guidance for airmen training and evaluation criteria and enhance the use of forecast products for pilot decision making.
- By FY 2015, Demonstrate the integration of navigation information and flight information, including weather information, into cockpit decision-making and shared situational awareness among pilots, dispatchers, air traffic controllers supported by NextGen air and ground capabilities.

Customer/Stakeholder Involvement: The Weather Technology in the Cockpit Program works with FAA organizations, other government agencies, and industry groups to ensure its priorities and plans are consistent with user needs. This is accomplished through:

- Guidance from the JPDO Next Generation Air Transportation System initiative through involvement in the Aircraft, Weather, and Integration Working Groups
- Inputs from the aviation community, including weather information providers, technology providers (e.g., avionics manufacturers, etc.), simulator training centers (e.g., Flight Safety, etc.)
- The annual National Business Aviation Association conference, the Friends/Partners in Aviation Weather Forum, scheduled public user group meetings, and domestic and international aviation industry partners
- Subcommittees of the FAA Research, Engineering and Development Advisory Committee – representatives from industry, academia, and other government agencies annually review program activity, progress, and plans.
- RTCA SC-206 and Society of Automotive Engineers G-10 subcommittees

R&D Partnerships: The Weather Technology in the Cockpit Program leverages research activities with members of other government agencies, academia, and the private sector through interagency agreements, university grants, and Memorandums of Agreement.

Partnerships include:

- National Center for Atmospheric Research.
- NASA Langley and Glenn Research Centers.
- Army Cold Regions Research and Engineering Laboratory.
- Public and private universities.
- Initiatives with airlines, pilots, and manufacturers.

Accomplishments: There are no previous accomplishments because the Weather Technology in the Cockpit program was a new start in FY 2009.

FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Developed initial Concept of Operations for weather technology in the cockpit based on foundational elements identified in the NextGen Concept of Operations, including integration of weather in flight deck decision support tools, weather dissemination management, and GA operations.
- Based on capabilities described in the NextGen Concept of Operations, developed initial comprehensive weather information user needs statement for the cockpit environment in different

types of operation (e.g., Part 121, Part 135, etc.) for each phase of flight (pre-flight, departure, en route, etc.) in the near-, mid-, and long-term NextGen operating environments.

- Assessed currently available onboard weather information processing technology.
- Identified the specific types of weather information being integrated into cockpit flight management systems (FMS) and the decisions supported by the information.
- Assessed currently available and emerging ground and cockpit communications interface technologies.
- Assessed currently available options for communications systems (air-ground, ground-air, and air-air).
- Identified test bed(s) to develop prototype weather information integration modules for flight deck technologies (e.g., FMS, EFB, etc.).

FY 2010 PROGRAM REQUEST:

Ongoing Activities

Work will continue in FY10 on the development of the comprehensive weather information user needs statement and the completion of the technology assessment, including on FMS ingestion of weather information and communications systems. A number of activities related to the proof of concept demonstrations and Weather Technology in the Cockpit prototyping will also continue in FY10. In addition, research activities related to the development of various types of guidance will be ongoing in FY10.

New Initiatives

The new research initiatives that will commence in FY10 are related to the proof of concept demonstrations. There will be an emphasis on determining the impact of communications systems on the provision of weather information in the cockpit and developing the standards and guidance necessary for obtaining design approvals for weather decision support systems.

KEY FY 2010 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Complete the initial comprehensive weather information user needs statement for the various part operators (i.e., Parts 91, 135, 121) for the different stages of flight in the near-, mid-, and long-term NextGen operating environments.
- Simulate and evaluate candidate systems for providing weather information to the cockpit in both machine-to-human and machine-to-machine modes.
- Identify, validate, and document data link system attributes that may affect the provision and use of weather-in-the-cockpit products and services.
- Conduct research to develop standards and guidance for design approval of weather decision support for cockpit use including integration of weather information with existing CNS/ATM information on multi-function displays.
- Continue development of prototype weather information integration modules for flight deck technologies (e.g., FMS, EFB, etc.).
- Continue research activities necessary to develop design approval guidance for hardware and software standards and data archiving and guidance for operational approval of products from non-government vendors.
- Conduct research to develop guidance for airmen training and evaluation criteria.
- Conduct research necessary to develop guidance to enhance the use of forecast products for pilot decision making.
- Conduct research necessary to evaluate procedures for including weather information in the flight deck decision making processes.
- Conduct research to quantify the regulatory impact of integrating weather information into flight deck decision-making processes.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2008)	0
FY 2009 Enacted	8,049
FY 2010 Request	9,570
Out-Year Planning Levels (FY 2011-2014)	42,172
Total	$59,791

Budget Authority ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Contracts					
Weather Technology in the Cockpit	0	0	0	7,894	8,945
Personnel Costs	0	0	0	155	539
Other In-house Costs	0	0	0	0	86
Total	0	0	0	8,049	9,570

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Basic	0	0	0	0	0
Applied	0	0	0	8,049	9,570
Development (includes prototypes)	0	0	0	0	0
Total	0	0	0	8,049	9,570

A12.f. – Weather Technology in the Cockpit Product and Activities	FY 2010 Request ($000)	Program Schedule FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
111-140 Weather in the Cockpit							
Concept and Requirements Development	500						
Develop comprehensive program plan for Weather Technology in the Cockpit.		♦					
Develop Concept of Operations for weather technology in the cockpit.		♦	◊		◊		◊
Develop comprehensive weather information user needs statement.		♦	◊				
Determine how the "common weather picture" is to be maintained when the 4D Wx Cube is being constantly updated (e.g., appropriate update rate impacts, workload).			◊	◊	◊	◊	
Technology Assessment	1,100						
Identify weather information currently being integrated in cockpit FMS		♦	◊				
Assess currently available onboard weather information processing technology		♦	◊				
Assess currently available and emerging ground and cockpit communications interface technologies		♦	◊				
Assess currently available options for communications systems (air-ground, ground-air, and air-air)		♦	◊				
Proof of Concept Demonstrations	2,811						
Simulate and evaluate candidate systems for weather in the cockpit		♦	◊	◊	◊		
Identify, validate, and document communications systems attributes affecting weather in the cockpit			◊	◊	◊		
Develop standards and guidance necessary to obtain design approvals of weather decision support tools			◊	◊	◊		
Simulate, test, and evaluate cockpit use of weather decision support tools and probabilistic forecasts				◊	◊	◊	◊
Simulate, test, and evaluate fully integrated cockpit use of NextGen operational concepts, including WTIC				◊	◊	◊	◊
Weather Technology in the Cockpit Prototype	2,900						
Develop prototype weather information integration modules for flight deck technologies (e.g., FMS, etc.)		♦	◊	◊	◊	◊	
Perform and support full mission demonstrations assessing weather information integrated in the cockpit				◊	◊	◊	◊
Policy, Standards, and Requirements	1,634						
Conduct research to develop guidance for airmen training and evaluation criteria		♦	◊	◊	◊	◊	◊
Conduct research to necessary to develop guidance to enhance use of forecasting products for pilot decision making		♦	◊	◊	◊	◊	◊
Conduct research necessary to evaluate procedures for including weather information in the flight deck decision making processes		♦	◊	◊	◊		
Quantify the regulatory impact of integrating weather into flight deck decision-making processes			◊	◊			
Recommend changes and revisions to US and international policies pertaining to WTIC				◊	◊	◊	◊
Personnel and Other In-House Costs	625						
Total Budget Authority	9,570	8,049	9,570	10,320	10,497	10,674	10,681

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A13.a.	Environment and Energy	$15,522,000

GOALS:
This program supports the following Flight Plan goals: Greater Capacity and International Leadership.

Intended Outcomes: The Environment and Energy Program helps achieve FAA's environmental compatibility goal and supports the FAA Flight Plan. The program also provides fundamental knowledge and tools to support the Next Generation Air Transportation System (NextGen) research and development plan. The efforts complement activities in technology and operational solutions and environmental management systems and models development under NextGen research.

The Program specifically supports the following outcomes:

The Flight Plan Noise Exposure Performance Target to reduce the number of people exposed to significant noise by four percent per year through FY 2012 as measured by a three-year moving average, from the three-year average for calendar year 2000 – 2002. Specific activities include:

- Conduct research and develop analytical tools to understand better the relationship between noise and emissions and different types of emissions, and to provide the cost-benefit analysis capability necessary for data-driven decision-making.
- Through the PARTNER Center of Excellence (COE) identify and better measure the issues and impacts associated with aircraft noise, and generate improved solutions to mitigate these problems.
- Identify and assess the impact and enable implementation of operational procedures to reduce noise in the NAS.
- Minimize the impact of aircraft noise – actions include: advancing the state of science/knowledge concerning effects of aircraft noise; improving aircraft certification standards and current operational procedures; and implementing improved noise control and mitigation measures.

The Flight Plan Aviation Fuel Efficiency Performance Target improves aviation fuel efficiency per revenue plane-mile by one percent each year through FY 2012, as measured by a three-year moving average, from the three-year average for calendar years 2000-2002. Specific activities include:

- Conduct research and develop analytical tools to better understand the relationship between noise, fuel burn and emissions and different types of emissions, and to provide the cost-benefit analysis capability necessary for data-driven decision making.
- Through the Partnership for AiR Transportation Noise and Emissions Reduction (PARTNER) Center of Excellence (COE) develop methodology and collect data to identify and more accurately characterize the sources and incremental impacts associated with aviation emissions, and generate improved solutions to mitigate these impacts.
- Assess the impact and enable implementation of operational procedures to enhance fuel efficiency and reduce aviation emissions in the NAS.
- Minimize the impact of aviation emissions – actions include: advancing the state of science/knowledge concerning atmospheric/health effects of aviation emissions; and improving aircraft certification standards and operational procedures; and implementing improved emissions control and mitigation measures.

Flight Plan International targets include fostering international environmental standards, recommended practices, and guidance material that are technically feasible, economically reasonable, provide a measurable environmental benefit and take interdependencies between various emissions and between emissions and noise into account. Specific activities include:

- Working with the international aviation community to reduce aircraft noise and emissions – actions include:
- Improving aircraft noise and engine exhaust emissions certification standards and operational procedures.

- Promoting compatible land use.
- Assessing the benefits of abatement measures to reduce population impacted by aircraft noise.
- Assessing the benefits of measures to improve fuel efficiency and reduce aviation emissions, and the potential to reduce health and climate impacts.
- Assessing the interrelationships and tradeoffs between measures to reduce aircraft noise and engine exhaust emissions.

The Program also contributes to the following outcomes:

- Providing the foundation for the NextGen research and development investments that help achieve the NextGen goal to promote environmental stewardship by reducing significant community noise and air quality emissions impacts in absolute terms, limiting or reducing the impact of aviation greenhouse gas emissions on global climate, and balancing aviation's environmental impact with other societal objectives. Specific activities include:
- Develop fundamental knowledge to aid in better science-based understanding of impacts of aircraft noise and aviation emissions on air quality and climate change to enable the NextGen goal of two to three-fold growth in capacity by 2025, while reducing significant community noise and air quality emissions in absolute terms.
- Developing tools to assess the ability of technologies for airframes, more efficient engines, advanced propulsion concepts, new fuels, new materials, market based options and policies to reduce source noise and emissions.

Agency Outputs: The program is developing and validating methodologies, models, metrics, and tools to assess and mitigate the effect of aircraft noise and aviation emissions in a manner that balances the interrelationships between emissions and noise and considers economic consequences. It is also developing computer models and impact criteria for use by civil aviation authorities in assessing proposed actions. Researchers are also developing a better science-based understanding of the impacts of aircraft noise and aviation emissions.

Research Goals:

- By FY 2010, demonstrate capability to conduct comprehensive cost-benefit analyses of environmental policy options with quantified uncertainties.
- By FY 2010, develop beta version of integrated framework for Aviation Environmental Design Tool (AEDT), Aviation Portfolio Management Tool (APMT), and Environmental Design (EDS) Tool.
- By FY 2010, deliver Version 1.0 of AEDT local for airport applications to Design Review Group.
- By FY 2010, incorporate methodology to account for population growth in the environmental impact assessments.
- By FY 2010, continue to develop and implement as they become available methods and models to analyze aircraft, auxiliary power units, and ground support equipment emissions and their impact on air quality.
- By FY 2010, exercise databases of particulate matter emissions to assess trends as a function of engine combustor technology and other emissions, and impacts on health and welfare, in order to advise options for mitigation, as required.
- By FY 2010, advance our understanding of the evolution of volatile particulate matter emissions in order to specify measurement and sampling procedures.
- By FY 2010, develop new technical guidance for noise and aircraft engine emissions certification.
- By FY 2010, develop new standards and methodologies to quantify and assess the impact of aircraft noise.
- By FY 2010, publish guidance material related to dispersion, chemical and transport modeling
- By FY 2010 provide computer models and impact criteria for use by civil aviation authorities in environmental assessments.
- By FY 2010 develop noise propagation models to better capture air turbulence, meteorology, terrain, and wave nature of low-frequency noise

- By FY 2010, test and deploy first elements of the website to educate and inform the public about aviation and the environment and to enable the community to participate actively in public processes.
- By FY 2011, develop and disseminate a preliminary planning version of Aviation Environmental Design Tool that will allow integrated assessment of noise and emissions inventories at the local, regional and global levels.
- By FY 2013, develop and field a fully validated suite of tools, including the Environmental Design Space (EDS) and Aviation Environmental Portfolio Management Tool (APMT), which will allow cost benefit analyses.
- By FY 2013, use collected hazardous air pollutant and particulate matter emissions data, directly measured from aircraft engines to replace, to the extent possible, approximation methods and factors used in modeling tools.
- By FY 2014, initiate development of simulation based environmental models

In addition, the program is conducting government-industry sponsored research through the Partnership for AiR Transportation Noise and Emissions Reduction (PARTNER) Center of Excellence (COE) to develop methodology and collect data to identify and more accurately characterize the sources and incremental impacts associated with aircraft noise and aviation emissions, and generate improved solutions to deal with these impacts. Specifics of these cooperative research efforts include:

- By FY 2010 develop and disseminate new methodologies and procedures to quantify and assess the impact of aircraft noise and aviation emissions for use by industry, government, and the public – also suggest a new metric to assess the acceptability of sonic boom from supersonic aircraft.
- By FY 2010, Advance best practices in aviation emissions particulate matter (PM) and Hazardous Air Pollutants (HAPs) measurements and characterize in-service aircraft
- By FY 2010, assess current understanding of aviation impacts on sleep disturbance and/or annoyance.
- By FY 2010, assess the impacts of aviation on regional air quality including the effects of particulate matter emissions that result when aircraft climb and cruise.
- By FY 2010 test and deploy elements of an Internet capability to educate and inform the public about aviation and the environment.
- By FY 2011, assess the level of certainty of aviation's impact on climate change and advance the state of practical science research, with special emphasis on addressing the identified major uncertainties and gaps in our understanding of current and projected impacts of aviation on climate and to develop metrics that will enable us to characterize those impacts for purposes of advising options for mitigation.

Customer/Stakeholder Involvement: FAA works closely with other federal agencies, industry, academia, and international governments and organizations to design R&D efforts that can mitigate the environmental impact of aviation. This unified regulatory approach to research identifies and influences technologies, models, regulations, certification criteria and policies that can improve our present and future global environment.

- The FAA Aviation Rulemaking Advisory Committee -- a formal standing committee composed of representatives from aviation associations and industry. The committee conveys its recommendations, advice, and information to FAA for consideration in rule making activities, and its harmonization working groups ensure that domestic and international aircraft noise certification regulations impose uniform standards upon the aircraft of all countries.
- International Civil Aviation Organization's (ICAO) Committee on Aviation Environmental Protection (CAEP) -- this committee establishes and continually assesses the adequacy of international aviation environmental standards for aircraft noise and engine exhaust emissions.
- The Federal Interagency Committee on Aviation Noise (FICAN) -- provides forums for debate over future research needs to better understand, predict and control the effects of aviation noise, and to encourage new technical development efforts in these areas. FICAN also evaluates such research and publishes its findings, which sometimes lead to recommendations on improving the state of the practice of aviation noise impact assessment and abatement. FICAN may conduct annual

public forums in different geographic regions as a means to better align noise abatement research with local public concerns.

- Aviation Emissions Characterization (AEC) Roadmap – developed by government and industry to coordinate research and regulatory activities. The objective of this long-range coordination mechanism is to advance the necessary understanding of particle formation, composition, and growth and transport mechanisms for assessing aviation's particulate emissions, secondary particulate formation from gaseous emissions, and hazardous air pollutants, and understanding their impact on human health and the environment. Ultimately, if warranted, this activity will help guide the development of aviation related technology that results in reduced emissions.
- NextGen -- FAA is leading an Environmental Working Group (EWG) responsible for leading environmental dimensions of the JPDO. The EWG comprises FAA, the National Aeronautics and Space Administration (NASA), the Environmental Protection Agency (EPA), DoD, Department of Commerce, Council on Environmental Quality, and Office of the Secretary of Transportation, as well as industry, academia, local government, and community groups. The efforts of the EWG are centered on advancing the national vision and recommendations for aviation in the NextGen and in the congressionally mandated study on "Aviation and the Environment."
- Climate Change Science Program (CCSP) – The FAA is working with the CCSP program office and its individual member agencies to focus research efforts that address the uncertainties and gaps in our understanding of current and projected impacts of aviation on climate, and to develop metrics to characterize these impacts.
- Commercial Alternative Aviation Fuel Initiative (CAAFI) -- Concerns about rising fuel costs, energy supply security and the environmental effects of aviation are providing a significant stimulus to take a fresh look at the use of alternative fuels for aviation. To forge a way ahead, FAA founded the Commercial Aviation Alternative Fuels Initiative (CAAFI) together with Airports Council International-North America (ACI-NA), the Air Transport Association (ATA) and the Aerospace Industries Association (AIA). CAAFI is teaming with the DoD to leverage their substantial efforts advancing alternative fuels for military aviation– driven by energy security considerations. CAAFI is also working with other Federal agencies such as NASA.
- Aviation Climate Change Research Initiative (ACCRI) – The FAA worked with NASA and NOAA to establish the ACCRI. The primary objective is to coordinate and sponsor collaborative research efforts to reduce key scientific uncertainties in quantifying aviation-related climate impacts while providing timely scientific input to inform optimum mitigation actions and policies for NextGen and ICAO.

R&D Partnerships: Through a series of Memorandums of Agreement (MOA), FAA works closely with NASA to identify long-term source abatement technologies for noise and emissions. Together, the agencies also work with industry and academia to assess the possible global impact of aircraft engine exhaust emissions. In FY 2005, FAA signed an MOA with DoD to pursue joint activities to understand and mitigate aviation noise and emissions. The FAA is also pursuing collaborative agreements with DoE, and EPA to leverage resources to address aviation's environmental impact.

- Through the JPDO NextGen, the program supports the EWG comprising FAA, NASA, EPA, DoD, Department of Commerce, Council on Environmental Quality, and Office of the Secretary of Transportation, as well as industry, academia, local government, and community groups. The EWG is pursuing an intensive, balanced approach, emphasizing alignment across stakeholders in developing needed business and technology architectures and policy options and approaches, as well as other relevant tools, metrics, and products to address aviation's environmental impact.
- The Volpe National Transportation Systems Center continues, in collaboration with the Environment and Energy Program, to provide substantial technical assistance in the areas of aircraft noise and engine emissions measurement and assessment.
- FICAN also offers a forum for partnership, as the Committee comprises all federal agencies concerned with aviation noise. The FAA works with this committee to foster greater, more cost-effective partnering in aviation noise research among all agencies.

Accomplishments: The number of people exposed to significant noise levels was reduced by about 90 percent between 1975 and 2007. Today's aircraft are also 70 percent more fuel-efficient than jet aircraft of the 1960s. Reduced fuel consumption and technologies to reduce emissions have also led to a 90 percent reduction in carbon monoxide, smoke, and other aircraft emissions. Specific recent accomplishments include:

FY 2007:

- Developed and demonstrated the first versions of AEDT, EDS and APMT. These tools will revolutionize approaches to aviation environmental assessment and regulation by enabling a comprehensive approach that assesses interdependencies and optimizes solutions based on cost-benefit analyses of impacts and mitigation. The tools will provide significant cost savings and other benefits to users.
- Released new versions of computer models to assess noise and emissions exposure incorporating the latest science and methodologies
- Completed the analyses supporting a Report to Congress, jointly with EPA, on the impact of aircraft emissions on air quality in nonattainment areas; ways to promote measures that allow aviation to enhance fuel efficiency and to reduce emissions; and opportunities to reduce air traffic inefficiencies that both waste fuel and increase emissions.
- Completed an assessment of the feasibility of using alternative fuels in commercial aviation. The assessment included a comprehensive assessment of well to tail emissions from coal and gas derived and renewable alternative fuels.

FY 2006:

- Released advanced version of highly influential advanced computer models for airport and heliport noise analysis –over 1000 users in over 40 countries. The models are used in over 160 U.S. airport studies involving more than $1.8 billion in airport noise compatibility grants, and recently provided the basis for an aircraft noise exposure prediction model for air tours in the Grand Canyon National Park.
- Released advanced version of a computer model that is used extensively by over 300 domestic and international users in airport air quality analyses and has won the EPA's highest endorsement.
- JPDO Environmental Integrated Product Team (E-IPT, now EWG) instituted a framework for establishing national goals for aviation and the environment and completed a "gap analysis" of environmental R&D programs necessary to meet NextGen goals.
- Reported to Congress regarding a comprehensive national study of ways to reduce aircraft noise and emissions.

FY 2005:

- Developed a handbook on aviation emissions that serves as the definitive source on this evolving issue.
- Developed a first order approximation to help airports assess aircraft particulate emissions and demonstrate compliance with the National Environmental Policy Act and the Clean Air Act.
- Developed a novel methodology for assessing noise, air quality emissions, and aviation climate impacts using a common currency.

FY 2004:

- Initiated a long-term, strategic effort to develop analytical tools to address the relationship between noise and emissions and different types of emissions. The long-term aim is a comprehensive approach to addressing all aspects of noise and emissions. The tools will facilitate better-informed decisions that can cost in excess of $10 billion to government and industry.
- Developed a modeling capability to produce annual inventories of aircraft greenhouse gas emissions and to assess aviation's forecasted global emissions.
- FY 2003:
- Established the PARTNER COE to allow partnerships with universities, research institutions, and industry to conduct exploratory research to identify and better measure the issues and impacts associated with aircraft noise and aviation emissions, and generate improved solutions to deal with these problems.
- Demonstrated new Continuous Descent Arrival noise abatement procedures in collaboration with NASA, academia, manufacturers, and airline and airport operators.

FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Noise and Emissions Analyses and interrelationships

- Completed an annual assessment of noise exposure and fuel burn.
- Delivered Aviation Environmental Design Tool (AEDT) Version 2.0, including Environmental Design Space (EDS), capability for ICAO Committee on Aviation Environmental Protection (CAEP)/8-related analysis.
- Delivered Aviation Portfolio Management Tool (APMT) Version 2.0 for CAEP/8 related analysis.
- Developed alpha version of AEDT tool for local application.
- Assessed noise and emissions for various technology, operational, and airspace enhancement scenarios.
- Demonstrated a new comprehensive approach to aviation environmental impact mitigation through a significant example problem.
- Continued upgrades to Integrated Noise Model (INM), Emissions and Dispersion Modeling System (EDMS), Modeling System For Assessing Global Noise Exposure (MAGENTA), and System For Assessing Aviation Global Emissions (SAGE) modules for incorporation into AEDT and to support existing customers as necessary.
- Developed business case and cost allocation for implementation of clean and quiet operational procedures.
- Worked with candidate airports to identify opportunities to implement clean and quiet operational procedures.
- Explored provisions for clean and quiet procedure usage in airspace redesign projects.

Aircraft noise

- Updated, developed, and published: procedures and technical guidance for noise certification of aircraft (subsonic jet and large transport airplanes, small propeller airplanes, and rotorcraft) that are both harmonized and simplified.
- Recommended and develop widely accepted impact metrics within noise community on sleep disturbance, annoyance, speech interference and perceptible vibration.
- Investigated the role of aviation noise in combined transportation noise around airports and its impact to communities.
- Investigated how average Day-Night-Level (DNL) performs compared to other noise impact metrics;
- Completed Land Use metrics study and publish a report.
- Conducted a study to analyze the four elements of the Balanced Approach (technology to reduce noise at the source, land use planning and management, quieter operational procedures, and operational restrictions) to noise abatement and their relationships.
- Continued to assess potential benefits of using newly developed noise reduction technologies and operational procedures; identify technology and operational goals for long-term reduction of aircraft noise.
- Continued developing interactive website/software to communicate complex noise technical information in a manner suitable for public distribution (NoiseQuest) and complete educational component of NoiseQuest.
- Advanced the sonic boom metric definition and continue to assess the applicability of existing noise metrics to sonic boom and determined annoyance of low boom waveforms to inform future decision-making regarding supersonic flight over land.
- With the “Aviation emissions activity,” conducted two COE focused sessions at a national and an international conference.

Aviation emissions

- Continued to develop and publish procedures and technical guidance materials for aircraft engine exhaust emissions testing and certification that are internationally harmonized and simplified, taking into account modernization in measurement methodologies and advancements in technical understanding.
- Continued to develop and disseminate methodologies and procedures to quantify and assess the impact of Particulate Matter and Hazardous Air Pollutant emissions on the environment.
- Conducted analysis of actual aircraft engine emissions measurements to better understand the generation of emissions during engine start-up, ground idle and taxi operation, during aircraft ground roll immediately prior to takeoff, and under varying ambient conditions.
- Continued to:
  - Assess potential benefits of using newly developed engine emissions reduction technologies, monitor state of technology advancements against the established goals for long term reduction of aircraft engine NO_X emissions, and initiate establishment of aircraft technology goals for long term reduction of fuel burn.
  - Assess potential benefits of optimized operational procedures to reduce emissions and fuel burn
  - Assess the atmospheric and health effects of aviation related emissions through the PARTNER COE.
- Tested and analyze particulate matter emissions and hazardous air pollutants from aircraft engines as identified under the AEC Roadmap; establish databases of PM emissions from aircraft engines that can be used for trends assessment.
- Initiated effort required to plan an additional broad airport and aircraft engine study to collect particulate matter and plume evolution/expansion data using light detection and ranging (LIDAR) technology that can be used advance our understanding of particulate emissions impact and to enhance dispersion analytical models embodied in our air quality tools.
- Developed preliminary agreed upon methods to measure PM emissions from commercial aircraft engines, taking into account an assessment of the impact of PM emissions.
- Assessed whether there are unique health effects associated with particulate matter emissions and hazardous air pollutants from aviation sources.
- Initiated assessment of uncertainty of impact of aviation on climate change with special emphasis on practical application of research results to aid the development of models to assess mitigation options.
- Initiated an assessment of the impacts of aviation on regional air quality, including the effects of emissions attributable to aircraft climb and cruise operations.
- With the “Aircraft noise activity,” conducted two COE focused sessions at a national and an international conference.

FY 2010 PROGRAM REQUEST:

In accordance with the agency’s mission and legislative mandates, FAA must assess and mitigate the environmental impacts of aviation. The FAA will continue to work with NASA, other Departments and Agencies, the manufacturing industry, and international authorities to support the development and implementation of aircraft environmental certification regulations through proactive response to changes in airplane and engine technology, measurement/analysis technology, regulatory policy, and international regulatory initiatives.
FAA will continue to work with NASA and other Departments and Agencies as appropriate in research efforts identifying noise and emissions reduction technologies that may enter the marketplace within the next 10-15 years. The agency will use these research findings to consider new environmental certification standards and procedures for the next generation of transport aircraft.

Ongoing Activities

Aerospace systems have historically been designed – and regulations for their certification and use have been written – as though aviation noise and various emissions had nothing to do with one another. However, aviation noise and emissions are highly interdependent phenomena. Future environmentally responsible aviation policy and rule making must be based on a new, interdisciplinary approach. Furthermore, this approach must be made as affordable as it is effective.

Existing analytical tools are inadequate to assess interdependencies between noise and emissions or analyze the cost/benefit of proposed actions. Accordingly, FAA is developing a robust new comprehensive framework of aviation environmental analytical tools and methodologies to perform these functions. The long-term aim is to provide a seamless, comprehensive set of tools to address all aspects of noise and emissions. The elements of this framework include:

- EDS' capability to provide integrated analysis of noise and emissions at the aircraft level.
- AEDT comprises EDS and other integrated aviation noise and emissions modules – will provide integrated capability of generating interrelationships between noise and emissions and among emissions at the local, regional and global levels.
- APMT comprises AEDT and other modules – will provide the common, transparent cost/benefit methodology needed to optimize national aviation policy in harmony with environmental policy.
- These AEDT and APMT tools will allow:
- Government agencies to understand how proposed actions and policy decisions affect aviation noise and emissions.
- Industry to understand how operational decisions affect proposed projects affecting aviation noise and emissions.
- The public to understand how actions by government and industry affect aviation noise and emissions.

Anticipated benefits of this initiative include the ability to:

- Optimize environmental benefits of proposed actions and investments.
- Improve data and analysis on airport/airspace capacity projects.
- Increase capability to address noise and emissions interdependencies in the resolution of community concerns.
- Aid in more effective R&D portfolio management.
- Remove environmental roadblocks to capacity growth.
- Continue global leadership for the United States in environmentally responsible aviation.

Other activities include:

- Continue activities through the PARTNER COE to develop methodology and collect data to identify and more accurately characterize the sources and incremental impacts associated with aircraft noise and aviation emissions, and generate improved solutions to deal with these problems.
- Continue updating and enhancing existing analytical tool modules (e.g., INM, EDMS, SAGE, MAGENTA), as necessary, to support existing customers and transition to AEDT.
- Support FAA role in the ICAO CAEP working groups for assessing the technological, scientific, operational, and economic aspects associated with setting international standards and recommended practices for aircraft noise and engine exhaust emissions.
- Continue efforts to ensure the currency of the regulation and technical guidance materials concerning aircraft noise and engine exhaust emissions certification requirements.

KEY FY 2010 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Noise and Emissions Analyses and interrelationships

- Complete an annual assessment of noise exposure and fuel burn.
- Complete a significant example analysis to demonstrate the benefit of cost-benefit analyses.
- Deliver Aviation Environmental Design Tool (AEDT) Version 3.0 for CAEP/8 related analysis.
- Deliver Aviation Portfolio Management Tool (APMT) Version 3.0 for CAEP/8 related analysis.
- Deliver Environmental Design Tool Version 3.0, including validated vehicle library and demonstrated capability within AEDT framework for CAEP/8 related analysis.
- Continue upgrades to INM, EDMS, MAGENTA, and SAGE modules for incorporation into AEDT and to support existing customers as necessary.
- Deliver comprehensive assessment, including quantified uncertainties, of EDS, AEDT, and APMT.

- Deliver tools to aid in demonstrating Continuous Descent Arrival (CDA) procedures in high-density environment.
- Develop tools to aid in demonstrating other environmentally beneficial procedures in the National Airspace System (NAS).

Aircraft noise

- Update and/or develop, as well as publish: procedures and technical guidance for noise certification of aircraft (subsonic jet and large transport airplanes, small propeller airplanes, and rotorcraft, as well as unmanned aerial vehicles, supersonic airplanes, and very light jets, if data are available) that are both harmonized and simplified.
- Initiate studies to:
- Advance understanding of long-term health impacts of noise exposure
- Update current understanding of aviation noise impacts on annoyance and/or sleep disturbance.
- Establish acceptability of low-boom supersonic flight as perceived indoors.
- Validate methodologies in noise propagation models to better capture the effects of air turbulence, meteorology, terrain, and wave nature of low-frequency noise.
- Assess state of knowledge on potential health impacts of aircraft noise and investigate methodologies to incorporate these impacts in the APMT framework.
- Support efforts to update land use planning compatibility guidance.
- Continue to assess potential global benefits of using newly-developed noise reduction technologies; identify technology goals for long term reduction of aircraft noise.
- Assess efficacy of NoiseQuest website.
- With the “Aviation emissions activity,” conduct two COE focused sessions at a national and an international conference.

Aviation emissions

- Continue to develop and publish:
- Procedures and technical guidance materials for affordable engine exhaust emissions testing and certification that are both harmonized and simplified.
- Develop and disseminate methodologies and procedures to quantify and assess the impact of Particulate Matter (PM) and Hazardous Air Pollutant (HAP) emissions in the aviation environment.
- Assess potential global benefits of using newly developed emissions reduction technologies, and identify technology goals for long term reduction of aircraft engine emissions and fuel burn.
- Advance best practices in aviation emissions PM and HAPs measurements.
- Continue collecting PM and HAPs measurement data and develop speciation profiles to improve and/or replace approximation methods and advance those data sources in models used to isolate sources, and identify aviation’s contribution to impacts.
- Continue assessment of the relative effect of various emissions on climate forcing functions.
- Continue comparison of detailed chemistry computations to aviation environmental tools approximations.
- Continue developing a model of near field plume evolution/expansion to feed air quality models.
- Assess whether there are unique health impacts or other environmental effects, particularly for NextGen scenarios, including particulate matter emissions and hazardous air pollutants from aviation sources, with specific focus on the aircraft engine.
- Continue assessment of uncertainty of impact of aviation on climate change.
- Complete assessment of the impacts of aviation on air quality including the effects of particulate matter emissions attributable to aircraft climb and cruise operations.
- Initiate development of guidance material related to dispersion, chemical and transport modeling (i.e., assessment of aviation-related air pollutant concentrations that effect air quality).

- Continue evaluation of the necessity for establishing standards pertaining to particulate matter emissions from aircraft engines.
- With the "Aircraft noise activity," conduct two COE focused sessions at a national and an international conference.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2008)	168,470
FY 2009 Enacted	15,608
FY 2010 Request	15,522
Out-Year Planning Levels (FY 2011-2014)	60,669
Total	$260,269

Budget Authority ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Contracts:					
Aircraft Noise	1,358	1,667	1,359	1,572	1,245
Engine Emissions	1,598	1,846	1,600	1,700	1,451
Noise & Emissions Analyses	10,759	10,320	10,213	9,900	10,100
Personnel Costs	1,985	2,005	2,036	2,127	2,319
Other In-house Costs	145	170	261	309	407
Total	15,845	16,008	15,469	15,608	15,522

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Basic	0	0	0	0	0
Applied	15,840	16,008	15,469	15,608	15,522
Development (includes prototypes)	0	0	0	0	0
Total	15,840	16,008	15,469	15,608	15,522

A13.a. - Environment and Energy Product and Activities	FY 2010 Request ($000)	Program Schedule					
		FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
091-016 Noise and Emissions Analysis							
Noise and Emissions Analysis	10,100						
Develop architecture for noise/emissions modules communication				◊	◊		
Develop model for assessing global exposure to noise from transport aircraft				◊	◊		
Validate the methodologies used to assess aircraft noise exposure and impact			◊		◊		
Release INM updates		♦					
Enhance aircraft noise and emissions modeling for airspace management activities		♦		◊	◊		
Release EDMS updates		♦					
Forecast future global emissions and noise		♦	◊	◊	◊	◊	◊
Release screening model for airport air quality, version 1, and updates		♦		◊		◊	
Validate methodologies used to assess aviation emissions and their impact on air quality			◊		◊		
Advance approximation methods for aircraft engine PM emissions			◊		◊		◊
Publish handbook for airport air quality analysis and updates		♦	◊	◊	◊	◊	
Guidance document for estimating and reducing emissions from ground support equipment				◊	◊		◊
Resource and guidance materials, and assessment protocol concerning hazardous air pollutants			◊		◊		◊
Develop AEDT		♦	◊	◊	◊	◊	◊
Release AEDT for local applications				◊		◊	◊
Develop EDS			◊		◊		◊
Develop APMT			◊		◊		◊
Harmonize AEDT and APMT databases and code management protocols		♦		◊	◊		◊
Integrate cost and socioeconomic data		♦		◊	◊	◊	◊
Aircraft Noise	1,245						
Assess aircraft noise reduction strategies research		♦	◊	◊	◊	◊	◊
Assess land use practices and metrics		♦		◊	◊	◊	◊
Publish AC 36-4 (and updates)		♦		◊		◊	
Develop a new international noise standard for subsonic jets and large airplanes					◊		◊
Develop a new international noise standard for small props and helicopters				◊			
Apply methodologies used to assess aircraft noise exposure and impact (APMT)			◊	◊			
Prepare COE reports, findings, and other activities		♦	◊	◊	◊	◊	◊
Engine Emissions	1,451						
Assess technological and scientific bases to support future ICAO engine emission standards		♦		◊		◊	
Develop alternative, simplified engine exhaust emissions certification test procedures		♦	◊		◊	◊	◊
Update AC 34-1			◊		◊	◊	
Develop measurement/sampling protocol for PM emissions from aircraft engines		♦	◊		◊	◊	◊
Develop science/metrics and reduce uncertainties to assess impact of aviation on climate change			◊	◊			◊
Prepare COE reports, findings, and other activities		♦	◊	◊	◊	◊	◊
Personnel and Other In-House Costs	2,726						
Total Budget Authority	15,522	15,608	15,522	15,440	15,264	15,079	14,886

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A13.b	NextGen Environmental Research – Aircraft Technologies, Fuels and Metrics	$19,470,000

Goals:
This program supports the following Flight Plan goals: Greater Capacity and International Leadership.

Intended Outcomes: The NextGen Technologies, Fuels and Metrics program helps achieve the NextGen goals to increase capacity by reducing significant community noise and air quality emissions impacts in absolute terms, and limit or reduce aviation greenhouse gas emissions impacts on the global climate. The program is focused on reducing current levels of aircraft noise, lair quality and greenhouse gas emissions and energy use and advancing alternative fuels for aviation use.

The Program specifically supports the following outcomes:

Demonstrate aircraft and engine technologies that reduce noise and air quality and greenhouse gas emissions at the source to a developmental level that will allow quicker industry uptake of these new environmental technologies in order to produce a fleet that will operate more efficiently with less energy usage and permit expansion of airports and airspace capacity in a manner consistent with the environmental goals of the NextGen plan.

Specific activities include developing and demonstrating:

- Certifiable aircraft technology that reduces aircraft fuel burn by 33% compared to a B737/CFM56, reducing energy consumption and greenhouse gas (CO_2) emissions;
- Certifiable engine technology that reduces landing and takeoff cycle (LTO) nitrogen oxide emissions by 70 percent, without increasing other gaseous or particle emissions, over the ICAO standard adopted at CAEP 2;
- Certifiable aircraft technology that reduces noise levels by 32 dB at each of the three certification points, relative to Stage 4 standards; and
- Determination of the extent to which new engine and aircraft technologies may be used to retrofit or re-engine aircraft so as to increase the level of penetration into the commercial fleet.

Demonstrate alternative fuels for aviation to reduce emissions affecting air quality and greenhouse gas emissions and increase energy supply security for NextGen.

Specific activities include developing and demonstrating:

- The feasibility of use of alternative fuels in aircraft systems, including successful demonstration and quantification of benefits; and
- Ensuring safety and devising transition strategies that enable “drop in” replacement for petroleum derived turbine engine fuels.

Determining the appropriate enhancements of goals and metrics to manage NextGen aviation environmental impacts that are needed to support Environmental Management Systems (EMSs) and allow a three times capacity growth.

Specific activities include:

- Establish and implement advanced metrics to better assess and control noise, air quality impacts and greenhouse gas emissions that may influence climate impacts from anticipated NextGen commercial aircraft operations.
- Evaluate and refine required technology and operational goals and targets to mitigate the environmental impact of projected NextGen and support EMSs implementation.

Agency Outputs: The program is protecting the environment by reducing significant aviation environmental impacts associated with noise, exhaust emissions and energy production. The program is also seeking to enhance energy efficiency and availability. The program will advance and mature, collaboratively with industry, engine and airframe technologies to reduce aviation noise, air quality and greenhouse gas emissions and energy use. It will also assess the feasibility of developing alternative aviation fuels that could serve as “drop in” replacements for today’s petroleum derived turbine engine fuels. Ultimately the program will demonstrate advanced technologies and alternative fuels in integrated ground and flight demonstrations.

The program is also helping to achieve NextGen goals by improving metrics to define and measure significant aviation environmental impacts. The program will improve the fundamental understanding of aviation environmental health and welfare and climate impacts and translate impact into improved metrics that can be used to better assess and mitigate aviation’s contribution. This program will identify the gaps in scientific knowledge to support NextGen; focus research in areas that will reduce key uncertainties to levels that allow action; and develop enhanced metrics to enable sound analyses. Ultimately, the program will enable the refinement of goals and targets to support dynamic environmental management systems (EMSs) to better manage and reduce aviation’s environmental impacts.

Research Goals:

By FY 2014, complete system analyses and demonstrations of near-and (CLEEN) mid-term airframe and engine technologies to reduce noise, emissions and fuel burn in integrated flight demonstrations for civil subsonic jet aircraft

Airframe and engine technologies supporting milestones:

- Advance system analyses and identify and pursue the development of first round engine and airframe technologies that will be the most effective at producing environmental benefits. (by FY 2010)
- Initiate demonstration of CLEEN technologies in ground rig tests (by FY 2010)
- Establish preliminary metrics and goals to guide CLEEN technology and alternative fuels development and support EMSs (by FY 2010)
- Complete demonstration of first phase CLEEN technologies in ground rig tests. (by FY 2011)
- Complete demonstration of CLEEN technologies in ground rig tests. (by FY 2012)
- Demonstrate airframe and engine technologies to reduce noise, emissions and fuel burn in integrated ground demonstrations for civil subsonic jet aircraft. (by FY 2013)
- Complete system analyses to identify the most promising CLEEN technologies for flight tests. (by FY 2013)
- Initiate demonstrations of first round of CLEEN airframe and engine technologies to reduce noise, emissions and fuel burn in integrated flight demonstrations for civil subsonic jet aircraft (by FY 2013)
- Complete system analyses and identify and pursue the development of second round engine and airframe technologies that will be the most effective at producing environmental benefits. (by FY 2014)
- Complete demonstrations of first round of CLEEN airframe and engine technologies to reduce noise, emissions and fuel burn in integrated flight demonstrations for civil subsonic jet aircraft(by FY 2014)

By FY 2013, complete comprehensive assessment of “drop in” alterative turbine engine fuels and develop implementation plan to address certification.

Alternative fuels supporting milestones:

- Complete effort to experimentally measure environmental impacts of “drop in” alternative turbine engine fuels. (by FY 2010)
- Complete detailed feasibility study, including economic feasibility, environmental impacts, and assessment of potential for gas turbine renewable alternative fuels. (by FY 2010)
- Initiate effort to experimentally assess environmental impacts and benefits and costs of renewable alternative turbine engine fuels. (by FY 2011)
- Conduct significant demonstration of “drop in” alternative turbine engine fuels. (by FY 2012)
- Conduct renewable alternative turbine engine fuels safety, environmental and business case assessments. (by FY 2012)

- Complete assessment of “drop in” alterative turbine engine fuels and develop implementation plan. (by FY 2013)

By FY 2014, investigate metrics, uncertainties on aviation emissions health and welfare and climate impact to facilitate EMSs implementation.

Metrics supporting milestones:

- Complete preliminary assessment of aviation’s impact on climate. (by FY 2011)
- Complete assessment of NextGen air quality and noise impacts. (by FY 2011)
- Reduce key uncertainties of aviation impacts to levels that better inform appropriate action. (by FY 2013)
- Refine metrics that more accurately capture aviation emissions health and welfare and climate impact and goals to facilitate EMSs implementation. (by FY 2014)
- Complete an updated assessment of aviation’s impact on climate. (by FY 2014)

Customer/Stakeholder Involvement: FAA works closely with other federal agencies, industry, academia, and international governments and organizations to design R&D efforts that can mitigate the environmental impact of aviation and explore alternative gas turbine fuels.

- NextGen -- FAA leads an Environmental Working Group (EWG) responsible for leading environmental dimensions of the JPDO. The EWG comprises FAA, NASA, the Environmental Protection Agency (EPA), DoD, Department of Commerce, Council on Environmental Quality, and Office of the Secretary of Transportation, as well as industry, academia, local government, and community groups. The efforts of the WG are centered on advancing the national vision and recommendations for aviation in the NextGen and in the congressionally mandated study on “Aviation and the Environment”, including advanced technology and alternative fuels development.
- Commercial Alternative Aviation Fuel Initiative (CAAFI) -- Concerns about rising fuel costs, energy supply security and the environmental effects of aviation are providing a significant stimulus to take a fresh look at the use of alternative fuels for aviation. To forge a way ahead, FAA founded the Commercial Aviation Alternative Fuels Initiative (CAAFI) together with Airports Council International-North America (ACI-NA), the Air Transport Association (ATA) and the Aerospace Industries Association (AIA). CAAFI is teaming with the DoD to leverage their substantial efforts advancing alternative fuels for military aviation– driven by energy security considerations. CAAFI is also working with other Federal agencies such as NASA.
- Climate Change Science Program (CCSP) – The FAA is working with the CCSP program office and its individual member agencies to focus research efforts that address the uncertainties and gaps in our understanding of current and projected impacts of aviation on climate, and to develop metrics to characterize these impacts.
- Aviation Climate Change Research Initiative (ACCRI) – The FAA worked with NASA and NOAA to establish the ACCRI. The primary objective is to coordinate and sponsor collaborative research efforts to reduce key scientific uncertainties in quantifying aviation-related climate impacts while providing timely scientific input to inform optimum mitigation actions and policies for NextGen and ICAO.

R&D Partnerships: As does the Environment and Energy Research Program and other NextGen activities, the NextGen Aircraft Technologies, Fuels and Metrics Program relies on a series of Memorandums of Agreement (MOA), to work closely with NASA and DoD. The FAA is also pursuing collaborative agreements with DoE, and EPA to leverage resources to address aviation’s environmental impact.

- Through the JPDO NextGen, the program supports the EWG comprising FAA, NASA, EPA, DoD, Department of Commerce, Council on Environmental Quality, and Office of the Secretary of Transportation, as well as industry, academia, local government, and community groups. The EWG is pursuing an intensive, balanced approach, emphasizing alignment across stakeholders in developing needed business and technology architectures, as well as other relevant tools, metrics, and products to address aviation’s environmental impact.

Accomplishments: This is a new effort to address the challenges of NextGen. However, relevant stakeholders have achieved significant accomplishments mitigating aviation's environmental impact. The number of people exposed to significant noise levels was reduced by about 90 percent between 1975 and 2006. Today's aircraft are also 70 percent more fuel-efficient than jet aircraft of the 1960s. Reduced fuel consumption has also led to a 90 percent reduction in carbon monoxide, smoke, and other aircraft emissions.

FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Noise, emissions and fuel burn reduction technologies maturation

- Established consortium for Continuous Low Energy, Emissions and Noise (CLEEN) Technologies.
- Awarded grants and contracts to conduct research.
- Developed a detailed plan to achieve NextGen environmental goals.
- Identified promising technologies for the reduction of noise, air quality and greenhouse gas emissions, and fuel burn that can be quickly matured for commercialization.
- Conducted component level analyses for promising technologies to optimize environmental and fuel burn performance.
- Conducted detailed integrated system level analyses for large and regional jets in order to identify the most promising technologies that can be quickly matured for commercialization.
- Initiated design of experiments for demonstration of technologies that optimize environmental and fuel burn performance.

Alternative turbine engine fuels

- Completed detailed feasibility study, including economic feasibility of "drop in" alternative turbine engine fuels.
- Initiated planning for experimentally quantifying environmental impacts of "drop in" gas turbine fuels in commercial aircraft engines.
- Initiated efforts to explore the potential of renewable gas turbine fuels for commercial applications.

NextGen Environmental Metrics, Goals and Targets

- Initiated efforts to improve understanding of how projected NextGen operations-generated emissions and noise impact human health and welfare, and global climate and identify key uncertainties.
- Determined research efforts necessary to reduce key uncertainties in our scientific understanding of environmental impacts and enhance models to assess those impacts for improved decision-making on mitigation and regulatory considerations.
- Initiated comprehensive modeling efforts to establish the relationship between aviation engine exhaust and the gaseous and particulate matter emissions that are deposited in the atmosphere.
- Identified and assess potential metrics to quantify the climate related impacts of commercial aircraft operations.
- Initiated baseline analyses of potential climate response due to aviation emissions with quantified uncertainties, based on the best available science and modeling tools.

FY 2010 PROGRAM REQUEST:

Anticipated increases in air transportation demand will place significant environmental pressures on various segments of the NextGen. The primary environmental constraints on the capacity and flexibility of the NextGen could be community noise, air quality, global climate impacts, and energy production and consumption. Environmental issues have constrained airport and airspace growth over the past decade. To ensure environmental impacts don't become a constraint on growth in NexGen, we need to accelerate introduction of quieter and cleaner technology in our fleets. Ninety percent of the environmental improvements (noise and emissions reductions) in the aviation system in the last 30 years have come from improved technology. Without a pipeline of near term (5-10 years) technology improvements, we cannot achieve the absolute reduction of significant noise and air quality impacts that we believe are necessary to enable NextGen growth. We need robust research and development to enable technology solutions to manage and mitigate environmental constraints. The goal is to have a fleet of quieter, cleaner aircraft that operate more efficiently with less energy.

We are currently facing larger research and development challenges at a time when we need to make larger technological leaps. Solutions that involve technology improvements in engines and airframes in a foreseeable timeframe require successful maturation and certification of new technologies within the next 5-10 years. This initiative establishes a world-class research consortium that can pursue technology goals to significantly reduce aviation noise, emissions, and fuel consumption. Establishing a world-class research consortium with industry- targeted on maturing technology- will help accelerate introduction of quieter and cleaner technology in our fleets so environmental issues do not become constraints.

The NextGen environmental goal is to reduce significant health and welfare impacts of aviation community noise and air quality (namely NO_X) emissions in absolute terms, notwithstanding growth. Although there is no quantitative goal for greenhouse gas emissions, the NextGen environmental goal does call for limiting or reducing the impact of aviation greenhouse gas emissions on global climate. There is a need to explore the appropriate metrics and system goals to establish significant impacts. There is also a need to develop a robust science-based understanding of impacts of NextGen aviation emissions on earth's climate and translate these impacts into improved metrics that can be used to better assess and mitigate aviation's contribution to climate change. These goals and metrics will enable Environmental Management Systems (EMSs) to mitigate impacts in a dynamic and cost-beneficial manner.

Elements of this initiative include:

- In collaboration with industry, mature noise, emissions and fuel burn reductions technologies (previously conceived by NASA and industry to Technology Readiness Levels (TRL) of 3-4) to levels (TRL 6) that enable industry to expedite introduction of these technologies into current and future products.
- Assess and advance the development of alternative "drop in" and renewable turbine fuels for aviation.
- Develop metrics to better assess and control noise, air quality and climate impacts from NextGen commercial aircraft operations and establish goals and targets to support EMSs implementation to mitigate impacts.

Ongoing Activities

Anticipated increases in air transportation demand will place significant environmental pressures on the national airspace system. Current operational trends show that environmental impacts resulting from aircraft noise and aviation emissions will be the principal constraint on the capacity and flexibility of the NextGen unless managed and mitigated. Aviation impacts affect community noise footprints, surface air quality, water quality, and the global climate. Environmental issues have already resulted in the delay and/or down-scaling of certain airport capacity projects over the past decade. Therefore, the NextGen environmental challenge is to reduce, in absolute terms the number of people exposed to significant noise levels; and the significant health and welfare impacts on the population of aviation

The challenge is also to reduce the impact of aviation greenhouse gas emissions on global climate – despite remaining scientific uncertainties regarding the nature of these impacts. And the overarching challenge is to better understand the impacts of aircraft noise and emissions on the population and climate, enabling appropriate mitigation actions. NextGen must achieve a balance between aviation's environmental impacts and other societal objectives, both domestically and internationally.

The FAA's strategic plan to address these challenges has elements: (1) enhance scientific understanding; (2) accelerate air traffic management efficiencies and improvements; (3) hasten the development of promising environmental improvements in aircraft technology; (4) advance renewable alternative fuels; and (5) explore market-based measures to offer assistance in managing aviation emissions growth.

This program is focusing on efforts to accelerate the aircraft technology development/penetration cycle and advancing alternative fuels. It is also focusing on enhancing scientific understanding of metrics and targets that more accurately capture aviation noise and emissions health and welfare and climate impacts to enable cost beneficial actions to mitigate these impacts.

The effort is pursuing the national goals and objectives delineated in the Energy and Environment component of the National Plan for Aeronautics R&D and Related Infrastructure (http://www.ostp.gov/cs/nstc/documents_reports) which provides quantitative integrated energy, fuel efficiency, emissions and noise research goals.
The ongoing elements of the effort include:

1. Continue the Continuous, Low Energy, Emissions, and Noise (CLEEN) effort focused on accelerating the maturation of lower energy, emissions and noise technology for aircraft and advancing environmentally beneficial alternative fuels.
2. Continue efforts to develop the fundamental scientific understanding to enable Environmental Management Systems to dynamically manage aviation environmental impacts in a cost beneficial manner.

KEY FY 2010 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Noise, emissions and fuel burn reduction technologies maturation

- Advance CLEEN systems analyses.
- Initiate CLEEN component level tests.
- Conduct detailed integrated system level analyses to identify the most promising technologies.
- Identify CLEEN airframe and engine technologies to pursue.
- Complete demonstration of CLEEN technologies in ground rig tests.
- Complete preliminary design of CLEEN demonstration experiment.

Alternative turbine engine fuels

- Experimentally measure environmental impacts of “drop in” alternative turbine engine fuels.
- Initiate planning for comprehensive “drop in” alternative fuel demonstration
- Initiate effort to experimentally quantify renewable fuels environmental impacts

NextGen Environmental Metrics, Goals and Targets

- Continue efforts to determine how projected NextGen operations-generated emissions and noise impact human health and welfare, and global climate and identify key uncertainties.
- Initiate implementation of research efforts necessary to reduce key uncertainties in our scientific understanding of environmental impacts and enhance models to assess those impacts for improved decision-making on mitigation and regulatory considerations.
- Continue comprehensive modeling efforts to establish the relationship between aviation engine exhaust and the gaseous and particulate matter emissions that are deposited in the atmosphere.
- Initiate a comprehensive particulate matter (PM), hazardous air pollutants (HAPs) and noise measurement campaign.
- Continue assessing potential metrics to quantify the climate related impacts of commercial aircraft operations.
- Continue baseline analyses of potential climate response due to aviation emissions with quantified uncertainties, based on the best available science and modeling tools.
- Initiate comprehensive assessment of NextGen air quality and noise impacts.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2008)	0
FY 2009 Enacted	16,050
FY 2010 Request	19,470
Out-Year Planning Levels (FY 2011-2014)	83,794
Total	$119,314

Budget Authority ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Request	FY 2009 Enacted	FY 2010 Request
Contracts:					
NextGen Environmental Research—Aircraft Technologies, Fuels and	0	0	0	15,829	18,312
Personnel Costs	0	0	0	221	954
Other In-house Costs	0	0	0	0	204
Total	0	0	0	16,050	19,470

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Request	FY 2009 Enacted	FY 2010 Request
Basic	0	0	0	0	0
Applied	0	0	0	16,050	19,470
Development (includes prototypes)	0	0	0	0	0
Total	0	0	0	16,050	19,470

A13.b.- NextGen Environmental Research— Aircraft Technologies, Fuels and Metrics Product and Activities	FY 2010 Request ($000)	Program Schedule					
		FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
111-150 NextGen Environmental Research							
Technology Maturation	13,812						
Establish CLEEN Consortium		♦					
System Level Assessments		♦	◊	◊	◊	◊	◊
Component Assessments			◊			◊	
Rig Tests – Round 1				◊			
Rig Tests – Round 2					◊		
Integrated Ground Demonstrators					◊	◊	
Flight Demonstrations						◊	◊
Prepare Annual Report		♦	◊	◊	◊	◊	◊
Alternative Turbine Fuels	2,000						
“Drop in” Fuels Feasibility Study		♦	◊				
Renewable Fuels Feasibility Study				◊	◊		
“Drop in” Fuels environmental Assessment		♦	◊				
Renewable Fuels Environmental Assessment				◊	◊		
Renewable Fuels Safety Assessment					◊		
“Drop in” Safety Assessment				◊	◊	◊	
“Drop in” Alternative Fuels Demonstration						◊	
Renewable Fuels Safety Assessment							◊
Renewable Fuels Demonstration							◊
Transition Plans						◊	◊
Prepare Annual Report		♦	◊	◊	◊	◊	◊
Metrics, Goals and Targets	2,500						
Define potential metrics		♦	◊				
Evaluate metrics and models		♦	◊		◊		
Advance measurement approaches			◊		◊		
Climate impact assessments		♦	◊	◊			◊
Air Quality assessments				◊	◊		◊
Noise assessments				◊	◊		◊
Refine metrics				◊	◊		◊
Assess efficacy of metrics				◊	◊		◊
Upgrade Assessment Models						◊	
Publish Research Reports		♦	◊	◊	◊	◊	◊
Personnel and Other In-House Costs	1,158						
Total Budget Authority	19,470	16,050	19,470	20,510	20,858	21,207	21,219

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Contract Dollars
A14.a.	System Planning and Resource Management	$1,766,000

Goals:
This program supports the following Flight Plan goals: Increased Safety, Greater Capacity, International Leadership, and Organizational Excellence.

Intended Outcomes: Demonstrate the value of working with international partners to leverage research programs and studies in order to improve safety and promote seamless operations worldwide. The ongoing activity will manage the FAA's R,E&D portfolio, meet the President's criteria for R&D, increase program efficiency, and maintain management and operating costs.

This activity produces the National Aviation Research Plan (NARP), an annual strategic plan for FAA R&D; administers the congressionally mandated R,E&D Advisory Committee (REDAC); conducts external program coordination; fosters future research opportunities; and provides program advocacy and outreach.

Agency Outputs: In FY 2010, the FAA will:

- Publish the annual National Aviation Research Plan.
- Host two REDAC meetings and multiple subcommittee meetings. The Committee provides advice on and reviews plans for the annual FAA R&D budget, and produces periodic and special reports providing advice and recommendations to FAA on its R&D program.
- Support the NextGen initiative.
- Prepare the annual R,E&D budget submission.
- Manage the R,E&D portfolio.
- Coordinate research activities with NASA through FAA's R&D Field Offices.
- Determine measures for the exchange of research information.

Research Goals:

- In FY 2010 through FY 2014, the FAA will maintain an R,E&D management workforce of no more than 10 percent of the total R,E&D workforce and will sustain the System Planning and Resource Management budget at two percent or less of the total R,E&D budget.
- By FY 2011, develop a strategic mapping for international collaboration.
- By FY 2011, identify a process to measure quality, timeliness, and value of collaboration.
- By FY 2016, calculate the value of R&D collaborations.

Customer/Stakeholder Involvement: The REDAC reviews FAA research commitments annually and provides guidance for future R,E&D investments. The members of this committee and its associated subcommittees are subject matter experts drawn from various associations, user groups, corporations, government agencies, as well as universities and research centers. Their combined presence in the REDAC fulfills a congressional requirement for FAA R&D to be mindful of aviation community and stakeholder input.

R&D Partnerships: DOT, JPDO, NASA and other Federal Agencies, and EUROCONTROL.

Accomplishments: Program accomplishments include:

- Published the National Aviation Research Plan (February 2008) and submitted to Congress with The President's FY 2009 Budget.
- Managed two REDAC meetings and over twelve subcommittee meetings, which reviewed FAA's proposed FY 2010 R,E&D program.
- Developed the FY 2010 R,E&D budget submission.
- Supported the JPDO's NextGen activities.
- Mapped FAA NextGen R&D programs to the R&D needs in the JPDO R&D Plan.
- Met the research goal for R,E&D management workforce and funding for System Planning and Resource Management in FY 2008.

FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Delivered the National Aviation Research Plan to Congress and submitted to Congress with The President's FY 2010 Budget.
- Provided strategic direction for the FAA R,E&D program.
- Obtained REDAC guidance for the FY 2011 R,E&D Program.
- Obtained REDAC review of and recommendations for FY 2011 R,E&D Program.
- Developed the FY 2011 R,E&D budget submission.
- Coordinated R&D activities with NASA and other partners.
- Supported NextGen activities.

FY 2010 PROGRAM REQUEST:

Ongoing Activities

FAA will continue supporting the work of the REDAC in its task to advise the Administrator on the R&D Program. In particular, it will seek the counsel and guidance of the committee for the FY 2012 program, review the proposed FY 2012 program prior to submission of the budget requirements to the DOT, and seek the committee's guidance during the execution of the R&D program. The agency will publish, as required by Congress, the National Aviation Research Plan and submit it to Congress concurrent with The FY 2011 President's Budget Request.

The program will review the President's R&D criteria, ensuring that the agency's R&D program remains viable and meets national priorities. It will also publish program activities and accomplishments, as well as foster external review of and encourage customer input to the R&D program.

The agency will maintain its field offices at the NASA Ames and Langley Research Centers as a vital part of efforts to coordinate and integrate the research and development programs of NASA and the FAA.

The program will manage the FAA R&D portfolio, identify high value products being produced by the R&D program, and promote the use of these products globally to generate value in the international market. In FY 2010, this initiative will determine measures for the exchange of research information.

KEY FY 2010 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

- Deliver the National Aviation Research Plan to the Congress (February 2010) with The President's FY 2011 Budget.
- Obtain REDAC recommendations on planned R,E&D investments for FY 2012.
- Support the REDAC in its preparation of other reports, as requested by the Administrator.
- Prepare the FY 2012 R,E&D budget submission.
- Manage FAA's R&D portfolio development process.
- Support NextGen activities.
- Coordinate R&D activities with NASA and other partners.
- Determine measures for the exchange of research information.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2008)	40,503
FY 2009 Enacted	1,817
FY 2010 Request	1,766
Out-Year Planning Levels (FY 2011-2014)	6,727
Total	$50,813

Budget Authority ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Contracts:					
R,E&D Plans and Programs	1,143	1,346	1,075	1,714	1,706
Personnel Costs	46	39	37	103	44
Other In-house Costs	0	3	72	0	16
Total	1,189	1,388	1,184	1,817	1,766

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Basic	0	0	0	0	0
Applied	1,189	1,388	1,184	1,817	1,766
Development (includes prototypes)	0	0	0	0	0
Total	1,189	1,388	1,184	1,817	1,766

A14.a. – System Planning and Resource Management Product and Activities	FY 2010 Request ($000)	Program Schedule					
		FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
011-130 R,E&D Plans and Programs							
R,E&D Portfolio Development	225						
Prepare guidance for budget formulation		♦	◊	◊	◊	◊	◊
Conduct R,E&D financial management		♦	◊	◊	◊	◊	◊
Prepare annual budget submissions		♦	◊	◊	◊	◊	◊
Congressionally Mandated	445						
Publish National Aviation Research Plan (NARP)		♦	◊	◊	◊	◊	◊
Conduct REDAC Meetings		♦	◊	◊	◊	◊	◊
NASA Field Offices	350	♦	◊	◊	◊	◊	◊
Performance Measurement	686						
Determine measures for exchange of research information		♦	◊				
Develop a strategic mapping for international collaboration			◊	◊			
Identify a process to measure quality, timeliness, and value of collaboration			◊	◊			
Calculate values of collaboration					◊	◊	◊
Personnel and Other In-House Costs	60						
Total Budget Authority	1,766	1,817	1,766	1,741	1,702	1,664	1,620

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

Budget Item	Program Title	Budget Request
A14.b.	William J. Hughes Technical Center Laboratory Facility	$3,614,000

GOALS:
This program supports the following Flight Plan goals: Increased Safety, Greater Capacity, International Leadership, and Organizational Excellence.

Intended Outcomes: The FAA sustains research facilities located at the William J. Hughes Technical Center (WJHTC) in support of its R&D program goals. These facilities consist of the Flight Program's Airborne Laboratories, Simulation Facilities including the Target Generation Facility and the Cockpit Simulators, and the Future Development Laboratories including the Human Factors Laboratory and the NextGen Laboratory.

Agency Outputs: R&D programs require specialized facilities to emulate and evaluate field conditions. Human factors projects require flexible, high fidelity laboratories to perform full mission, ground to air, human-in-the-loop simulations. Researchers measure baseline human performance using existing ATC configurations, and deltas in performance when new systems or procedures are introduced in order to evaluate human factors issues. These laboratories are comprised of integrated cockpit and air traffic control workstation simulators, and the performance issues they delve into reflect the perspectives of the pilot and flight crew. Airborne and navigation projects require flying laboratories, aircraft utilized for research and development, which are specially instrumented and reconfigurable to support a variety of projects.

Research Goals: The FAA will work to provide an integrated laboratory platform for the purpose of demonstrating operational procedures, defining human and system performance requirements, full mission demonstrations integrating NextGen air and ground capabilities for pilot separation responsibility and controller efficiencies, and analysis, evaluation, and validation of R&D milestones.

Customer/Stakeholder Involvement: The WJHTC facilities directly support agency projects and integrated product teams in the following areas:

- FAA's Air Traffic Organization (ATO) – The WJHTC laboratories support the ATO in the areas of capacity and air traffic management; communications, navigation, and surveillance; NextGen concept validation; weather; airport technology; aircraft safety; human factors; information security; environment and energy.
- Communications, Navigation, and Surveillance – The Flight Program Team has been supporting on site flight tests of the Precision Runway Monitoring System in Detroit to aid in the development of a system to aid in the reduction of runway incursions.
- Next generation air transportation system (NextGen) – The WJHTC laboratories support concept validation.
- Automated Dependent Surveillance-Broadcast – Numerous flight test hours have been expended in support of field testing the new ITT system in southern Florida. Each test leads to improvements made to enhance the overall system.
- Terminal Instrumentation Procedures (TERPS) – Routine flight tests are ongoing in the development of GPS Helicopter precision approaches to a heliport.
- Wide Area Augmentation System – The Flight Program Team has been working with the WAAS program, Bombardier Aircraft, Canadian Marconi, and Honeywell to design, test and certify a WAAS installation into a Bombardier Global 5000 aircraft.

R&D Partnerships: In addition to FAA's research programs, WJHTC laboratories partnerships include:

- U.S. Air Force – The Flight Program Team has performed numerous test of the GPS signal security with the U.S. Air Force.
- National Transportation Safety Board – The Flight Program Team has, in the past, participated in recreation of aircraft accidents for the purpose of collecting data in an attempt to determine the underlying cause.
- Boeing - The Simulation team is working a under cooperative research and development to build capability to perform R&D of 4-D trajectory negotiation and execution, and Unmanned Aerial Systems (UAS)

- EUROCONTROL - The simulation team exchanges aircraft modeling data for use in TGF
- Industry –
  - Flight tests are on-going to help develop and deploy the ITT ADS-B system in southern Florida as well as the work being done with Bombardier, Canadian Marconi, and Honeywell in the design, installation and certification on GPS WAAS onboard a Bombardier Global 5000 aircraft.
  - The Simulation team has partnered with UFA Inc. to quantify voice recognition and response (VRR) system performance in Technical Center Human in the Loop (HITL) simulations.

Facilities supporting R&D Goals at the FAA's WJHTC: The following laboratory facilities provide the reliable test bed infrastructure to support these R&D customers, program goals, and outputs for the FAA:

- Simulation Facilities – Target Generator Facility (TGF) and Cockpit Simulators
  - Approach Procedures
  - Next Generation Air Transportation System
  - Airspace Design
  - Operational Evolution Plan Concept Validation
  - Dynamic Vertical Reduced Separation Minima
  - Unmanned Aerial Systems
- Research & Development Flight Program – Airborne Laboratories
  - Satellite Communications and Navigation Programs
  - Separation Standards
  - Wide Area Augmentation System
  - Terminal Instrumentation Procedures
  - Aircraft Safety
  - Runway Incursion
  - Next Generation Air Transportation System
  - Local Area Augmentation System
  - ADS-B
  - Common Automated Radar Terminal System
- Research & Development Human Factors Laboratory
  - Air Traffic Control Human Factors
  - Airway Facilities Human Factors
  - Operational Evolution Plan Concept Validation

Accomplishments: The FAA's WJHTC's laboratory facilities provide the reliable test bed infrastructure to support R&D program goals and outputs. Outstanding program accomplishments include:

FY 2008:

- The Flight Program Team has participated in the development and acceptance flight testing of the ITT ADS-B system in southern Florida. These test consisted on numerous dual aircraft, highly scripted, flights to test system resolution, accuracy and performance.
- Simulation Team successfully implemented Boeing's Aircraft Intent Description Language (AIDL)
- Simulation Team successfully completed manual flight capability in its Embraer-175 cockpit simulator using the manufacturer's software.
- Research Development & Human Factors Laboratory (RDHFL) developed Aircraft Geometric Height Measurement Element (AGHME): 2006 – 2009 In support of Domestic Reduced Vertical Separation Minimum (D-RVSM) – consists of changing the current 2,000-ft vertical separation standard applicable to pairs of aircraft operating between 29,000 and 41,000 (flight levels 290 and 410), inclusive, to 1,000 ft. AGHME estimates aircraft geometric height. An already existing analysis

process will then make use of this geometric height, in conjunction with other information, to determine aircraft height-keeping performance.

FY 2007:

- The Flight Program Team has participated in the development and improvement flight testing of the FAA's "Legacy" ADS-B system operational on the east coast of the US. These test consisted on numerous multi-aircraft flights to test system resolution, accuracy and performance.
- Simulation Team successfully completed baseline evaluations of the UFA VRR system.
- Simulation Team successfully demonstrated a control tower visualization capability.
- Research Development & Human Factors Laboratory (RDHFL) Future Terminal Workstation (FTWS): 2007- 2010 The project is part of the Federal Aviation Administration (FAA) human factors research program to design and evaluate new air traffic control (ATC) capabilities for the 2015-2020 timeframe. The new capabilities include new automation tools; user interfaces (UIs) and interaction techniques, and ATC procedures. The FTWS project focuses on the environment known today as the Terminal Radar Approach Control (TRACON).
- The NextGen Laboratory Team gave several demonstrations of PAS throughout the week ending September 28, 2007, to the FAA UAS Planning Team, showing some basic scenarios in support of the SC203 Document concerning Unmanned Aerial Systems integration into the NAS.
- Research Development & Human Factors Laboratory (RDHFL) Tower Operations Digital Data System (TODDS): 2007 – 2010 Integrated tool to display aircraft location, electronic flight data, and other digital data for the ground and local controller positions in ATC Towers. Address the current limitations of paper and electronic flight strip systems by:
  - Consolidating information into a single source
  - Connecting flight data to aircraft position
  - Providing a means to organize flight data information spatially; Touch screen displays
  - Presenting only the information that controllers need when they need it
  - Providing timing capability, reminders, and notices of expired information

FY 2006:

- Numerous flight tests were performed, in multiple aircraft, throughout the US to test GPS WAAS performance, availability and accuracy.
- Simulation Team successfully supported research and development of large airspace sectors in a study called Big Airspace
- Simulation Team successfully supported research and development of an integration controller workstation in a study called Future En route Workstation (FEWS).
- Research Development & Human Factors Laboratory (RDHFL) is Big Airspace: 2006 This experiment examined the impact of extending terminal procedures and spacing into en route airspace (Big Airspace (BA) concept) for both arrival and departure sectors. The simulation examined controller performance in a high fidelity, human-in-the-loop simulation designed to compare a baseline condition to two alternative operating conditions: a Big Airspace/Collocated condition (BA/C) and a Big Airspace/Non-collocated condition (BA/N).
- The NextGen Laboratory Team (NGL) supported HOST testing with the Display System Replacement (DSR) team to provide DSR CHI (Computer Human Interface) requirements for the demonstration that took place on January 18 and 19, 2006.

FY 2009 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

Simulation Facilities

- Simulation Team integrated TGF and Boeing Simulation Lab for UAS simulation capability.
- Simulation Team added 4-D trajectory negotiation capability using AIDL to its B-737 flight management system trainer.
- Simulation Team completed the evaluation of the UFA VRR system.

Flight Program's Airborne Laboratories

- The Flight Program Team improved its operational aircraft to enhance their ability to support project flight test. These included the installation of three new antennas to support the ADS-B and NextGen programs and the modification of the aircraft to permit the display of Advanced Navigational signals unto the basic cockpit displays, into the Bombardier Global 5000 test aircraft (N47).

Future Development Laboratories

- The Laboratory Future Development Team made improvements to laboratory environment to enhance our capability to support NextGen. These included the reallocation of Laboratory Space and Resources, co-locating, connecting, designing and installing necessary Laboratory Infrastructure and components to support, ADS-B, SWIM and NextGen programs based on their requirements and schedules.

FY 2010 PROGRAM REQUEST:

Ongoing Activities

The FAA will continue to modify, configure, and sustain the research facilities located at the William J. Hughes Technical Center (WJHTC) to support its R&D program goals.

New Initiatives

No new initiatives are planned in FY 2010.

KEY FY 2010 MAJOR ACTIVITIES AND ANTICIPATED ACCOMPLISHMENTS:

The test beds at the WJHTC provide the necessary infrastructure for R&D programs to achieve agency goals. Specific milestones and products are contained within individual programs.

Simulation Facilities

- Simulation Team will conduct a human in the loop (HITL) simulation of UAS in the NAS.
- Simulation Team will conduct an end-to-end evaluation of 4-D trajectory prediction and negotiation using TGF and B-737-800 cockpit simulator.

Flight Program's Airborne Laboratories

- The Flight Program Team hopes to make great progress in the replacement of the Convair flight test aircraft with new and more fleet-representative test aircraft. This effort includes the completion of the Exhibit 300 process and the authorization from the Capital Investment Team for FY-11 funding.

Future Development Laboratories

- The Laboratory Future Development Team intends on making improvements to laboratory environment to enhance our capability to support NextGen. These includes the reallocation of Laboratory Space and Resources, co-locating, connecting, designing and installing necessary Laboratory Infrastructure and components to support, ADS-B, SWIM and NextGen programs based on their requirements and schedules.

APPROPRIATION SUMMARY

	Amount ($000)
Appropriated (FY 1982-2008)	106,890
FY 2009 Enacted	3,536
FY 2010 Request	3,614
Out-Year Planning Levels (FY 2011-2014)	15,612
Total	$129,652

Budget Authority ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Contracts:					
WJHTC Laboratory Facility	572	779	667	684	859
Personnel Costs	2,712	2,584	2,642	2,672	2,675
Other In-house Costs	75	67	106	180	80
Total	3,359	3,430	3,415	3,536	3,614

OMB Circular A-11, Conduct of Research and Development ($000)	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Basic	0	0	0	0	0
Applied	3,359	3,430	3,415	3,536	3,614
Development (includes prototypes)	0	0	0	0	0
Total	3,359	3,430	3,415	3,536	3,614

A14.b. – WJHTC Laboratory Facility Product and Activities	FY 2010 Request ($000)	Program Schedule					
		FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
011-140 WJHTC Laboratory Facility							
Simulation Facilities (Target Generator Facility, Cockpit Simulators)	60						
Approach Procedures		♦	◊				
Next Generation Air Transportation System (NextGen)		♦	◊	◊	◊	◊	◊
Airspace Design		♦	◊	◊	◊	◊	◊
Operational Evolution Plan Concept Validation		♦	◊				
Dynamic Vertical Reduced Separation Minima (DRVSM)		♦	◊	◊	◊	◊	◊
Unmanned Aerial Systems (UAS)		♦	◊	◊	◊	◊	◊
Research & Development Flight Program (Airborne Laboratories)	739						
Satellite Communications and Navigation Programs		♦	◊	◊	◊	◊	◊
Separation Standards		♦	◊	◊	◊	◊	◊
Wide Area Augmentation System (WAAS).		♦	◊	◊	◊	◊	◊
TERPS		♦	◊	◊	◊	◊	◊
Aircraft Safety		♦	◊	◊	◊	◊	◊
Runway Incursion		♦	◊	◊	◊	◊	◊
Next Generation Air Transportation System (NextGen)		♦	◊	◊	◊	◊	◊
Local Area Augmentation System (LAAS)		♦	◊	◊	◊	◊	◊
ADS-B		♦	◊	◊	◊	◊	◊
Common Automated Radar Terminal System		♦	◊	◊	◊	◊	◊
Research and Development Human Factors Laboratory	60						
Air Traffic Control Human Factors		♦	◊	◊	◊	◊	◊
Airway Facilities Human Factors		♦	◊	◊	◊	◊	◊
Operational Evolution Plan Concept Validation		♦	◊				
Personnel and Other In-House Costs	2,755						
Total Budget Authority	3,614	3.536	3,614	3,728	3,841	3,959	4,084

Note: Out year numbers are for planning purposes only. Actual funding needs will be determined through the annual budget process.

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GRANTS-IN-AID FOR AIRPORTS
(LIQUIDATION OF CONTRACT AUTHORIZATION)
(LIMITATION ON OBLIGATIONS)
(AIRPORT AND AIRWAY TRUST FUND)

For liquidation of obligations incurred for grants-in-aid for airport planning and development, and noise compatibility planning and programs as authorized under subchapter I of chapter 471 and subchapter I of chapter 475 of title 49, United States Code, and under other law authorizing such obligations; for procurement, installation, and commissioning of runway incursion prevention devices and systems at airports of such title; for grants authorized under section 41743 of title 49, United States Code; and for inspection activities and administration of airport safety programs, including those related to airport operating certificates under section 44706 of title 49, United States Code, 3,000,000,000 to be derived from the Airport and Airway Trust Fund and to remain available until expended: Provided, That none of the funds under this heading shall be available for the planning or execution of programs the obligations for which are in excess of $3,515,000,000 in fiscal year 2010, notwithstanding section 47117(g) of title 49, United States Code: Provided further, That none of the funds under this heading shall be available for the replacement of baggage conveyor systems, reconfiguration of terminal baggage areas, or other airport improvements that are necessary to install bulk explosive detection systems: Provided further, That notwithstanding any other provision of law, of funds limited under this heading, not more than $93,422,000 shall be obligated for administration, not less than $15,000,000 shall be available for the airport cooperative research program, and not less than $22,472,000 shall be for Airport Technology Research.

Program and Financing (in millions of dollars)

Identification code: 69-8106-0-7-402		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Obligations by program activity:			
	Direct Program:			
00.01	Grants-in-aid for airports	3,557	3,386	3,385
00.02	Personnel and related expenses	80	87	93
00.03	Airport technology research	19	19	22
00.05	Small community air service	10	8	. . . .
00.06	Airport Cooperative Research	10	15	15
01.00	Total direct program	3,676	3,515	3,515
09.01	Reimbursable program	0	16	14
10.00	Total new obligations	3,676	3,531	3,529
	Budgetary resources available for obligation:			
21.40	Unobligated balance carried forward, start of year	203	102	407
22.00	New budget authority (gross)	3,415	3,836	3,529
22.10	Resources available from recoveries of prior year obligations	160	. . . .	. . . .
23.90	Total budgetary resources available for obligation	3,778	3,938	3,936
23.95	Total new obligations	-3,676	-3,531	-3,529
24.40	Unobligated balance carried forward, end of year	102	407	407
	New budget authority (gross), detail:			
	Discretionary:			
40.26	Appropriation (trust fund)	4,399	3,600	3,000
40.49	Portion applied to liquidate contract authority	-4,399	-3,600	-3,000
43.00	Appropriation (total discretionary)	. . . .	. . . .	. . . .
49.00	Contract authority	. . . .	. . . .	. . . .
49.35	Contract authority Permanently reduced	. . . .	. . . .	. . . .
49.36	Unobligated balance permanently reduced	. . . .	. . . .	. . . .
49.90	Contract authority (total discretionary)	. . . .	. . . .	. . . .
	Mandatory:			
66.10	Contract authority (Vision 100)	3,675	. . . .	. . . .
66.10	Contract authority (49 USC 48112)	. . . .	. . . .	. . . .
66.10	Contract authority (HJ Res 52)	. . . .	. . . .	. . . .
66.10	Contract authority	. . . .	3,900	3,515
66.35	Contract authority permanently reduced	-271	-80	. . . .
66.90	Contract authority (total mandatory)	3,404	3,820	3,515
58.00	Spending authority from offsetting collections	11	16	14
70.00	Total new budget authority (gross)	3,415	3,836	3,529
	Change in obligated balances:			
72.40	Obligated balance, start of year	5,368	5,065	5,082
73.10	Total new obligations	3,676	3,531	3,529
73.20	Total outlays (gross)	-3,819	-3,514	-3,510
73.45	Recoveries of prior year obligations	-160	. . . .	. . . .
74.00	Change in uncollected customer payments	. . . .	. . . .	. . . .
74.40	Obligated balance, end of year	5,065	5,082	5,101
	Outlays (gross), detail:			
86.90	Outlays from new discretionary authority	664	728	726
86.93	Outlays from discretionary balances	3,155	2,786	2,784
87.00	Total outlays (gross)	3,819	3,514	3,510
	Offsets:			
	Against gross budget authority and outlays:			
88.40	Offsetting collections (cash) from: Non-Federal sources	-11	-16	-14

	Net budget authority and outlays:			
89.00	Budget authority	3,404	3,820	3,515
90.00	Outlays	3,808	3,498	3,496

Subchapter I of chapter 471, title 49, U.S. Code (formerly the Airport and Airway Improvement Act of 1982, as amended) provides for airport improvement grants, including those emphasizing capacity development, safety and security needs; and chapter 475 of title 49 provides for grants for aircraft noise compatibility planning and programs.

Object Classification (in millions of dollars)

Identification code: 69-8106-0-7-402		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Direct obligations:			
	Personnel compensation			
11.1	Full-time permanent	51	56	61
11.3	Other than full-time permanent	1	1	1
11.5	Other personnel compensation	1	1	1
11.9	Total personnel compensation	53	58	63
12.1	Civilian personnel benefits	13	14	14
21.0	Travel and transportation of persons	4	5	5
25.2	Other services	31	39	45
26.0	Supplies and materials	1	1	1
31.0	Equipment	2	3	3
41.0	Grants, subsidies, and contributions	3,572	3,395	3,384
99.0	Subtotal, direct obligations	3,676	3,515	3,515
99.0	Reimbursable obligations	. . . .	16	14
99.9	Total new obligations	3,676	3,531	3,529

Personnel Summary

Identification code: 69-8106-0-7-402		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Direct:			
1001	Civilian full-time equivalent employment	518	550	566
	Reimbursable:			
2001	Civilian full-time equivalent employment	2	6	6

EXHIBIT III-1

GRANTS-IN-AID FOR AIRPORTS
Summary by Program Activity
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

	FY 2008 ACTUAL	FY 2009 ENACTED	FY 2009 ENACTED (TOTAL)*	FY 2010 REQUEST	CHANGE FY 2009-2010
Grants-in-Aid for Airports	3,395,112	3,384,698	4,482,498	3,384,106	-592
Personnel & Related Expenses	80,676	87,454	89,654	93,422	5,968
Airport Technology Research	18,712	19,348	19,348	22,472	3,124
Small Community Air Service	10,000	8,000	8,000	0	-8,000
Airport Cooperative Research	10,000	15,000	15,000	15,000	0
TOTAL	**3,514,500**	**3,514,500**	**4,614,500**	**3,515,000**	**500**
FTEs					
Direct Funded	518	550	550	566.0	**16.0**
Reimbursable	2	6	6	6	**0**

* Includes funding provided by the American Recovery and Reinvestment Act of 2009. This act provides supplemental funding of $1.1 billion to Grants-in-Aid for Airports.

Program and Performance Statement

This account provides funds for planning and developing a safe and efficient national airport system to satisfy the needs of the aviation interests of the United States, with due consideration for economics, environmental compatibility, local proprietary rights, and safeguarding the public investment.

EXHIBIT III-2

GRANTS-IN-AID FOR AIRPORTS
SUMMARY ANALYSIS OF CHANGE FROM FY 2009 TO FY 2010
Appropriations, Obligation Limitations, and Exempt Obligations

Item	Change from FY 2009 to FY 2010	FY 2010 PC&B by Program	FY 2010 FTEs by Program	FY 2010 Contract Expenses	Total
		Note Columns are Non-Add			
FY 2009 Base					
Grants-in-aid for Airports Appropriations, Obligations, Limitations, and Exempt Obligations		**72,938**	**550**	**39,107**	**$3,514,500**
Adjustments to Base					
Decrease to AIP Grants	($592)				
Small Community Air Service (SCASDP)	($8,000)				
Annualized FTEs	1,205	1,205	8		
Annualized FY 2009 Pay Raise	993	993			
FY 2010 OSI	1,616	1,616			
FY 2010 SCI	339	339			
Non-pay Inflation	170				
Subtotal, Adjustments to Base	**($4,268)**	**$4,153**	**8**	**$0**	**($4,268)**
New or Expanded Programs					
Engineering Support (Electronic/Surveillance)	80	80	0.5		
Airport Safety Management Systems (SMS) staff	320	320	3.5		
CATS Database Development & Support	100			100	
ICAO Support --travel/position	180	80	0.5	100	
CCMIS Improvements	0			0	
Private Airport Data Collection	300			300	
Safety & Pavement Research	2,830	80	0.5	2,750	
Document Scanning & Development Initiative	478			478	
APP Information Technology Staff	80	80	0.5		
Airspace Staffing (Service Center locations)	240	240	1.5	0	
Planner/GIS Staffing	80	80	0.5		
Engineering Contract Support	0			0	
Compliance Lawyer	0	0	0.0		
Wildlife Biologist	80	80	0.5		
AIP Benefit/Cost Analysis (BCA) Review	0			0	
Subtotal, New or Expanded Programs	**4,768**	**1,040**	**8.0**	**3,728**	**4,768**
Total FY 2010 Request	**$500**	**$78,131**	**566.0**	**$42,835**	**$3,515,000**

Detailed Justification for Grants-in-Aid for Airports

Grants-in-Aid for Airports	**FY 2010 Request: 3,384,106**

Overview:

Airports are an essential part of the aviation system infrastructure. Their design, structural integrity, and ongoing maintenance have a direct impact on safety, capacity and efficiency. Through the Airport Improvement Program (AIP), the agency funds a range of activities to ensure the safety and capacity of U.S. airports. The proposed AIP funding level will provide sufficient funding for all high priority safety, capacity, and security projects.

FY 2009 Base:

In FY 2009, FAA is emphasizing initiatives to implement airport Safety Management Systems (SMS), to continue the reduction in runway incursions caused by vehicle/pedestrian deviations, and to continue progress at improving Runway Safety Areas (RSAs). In addition, the AIP program provides priority consideration for funding safety-related development for airports that benefit both commercial service and general aviation operations.

In FY 2009, the Office of Airports (ARP) will increase capacity at the 35 Operational Evolution Partnership (OEP) airports or major metropolitan areas by supporting, processing, and approving Airport Master Plans and Environmental Studies and by directing funding investments toward the construction of runway projects (new runways, runway extensions, and airfield reconfigurations) as the most effective method of increasing throughput. ARP expects to administer the AIP program by issuing approximately 2,200 grants to airport sponsors. We will also strive to increase the safety, security and capacity of the global civil aerospace system in an environmentally sound manner.

In addition to the FY 2009 base, the program received additional funding provided by the American Recovery Act of 2009. This act provides supplemental funding of $1.1 billion to Grants-in-Aid for Airports.

Anticipated FY 2009 Accomplishments:

- Continue improvements to RSAs. 26 RSAs will be improved in FY 2009.
- Continue Airport Cooperative Research, working with the Transportation Research Board to select and fund projects.
- Continue rulemaking process to implement Airport SMS.
- Provide AIP funding for three rural airports permitting a minimum 24 hour Visual Flight Rules (VFR) access.
- Implement AIP funding for all approved Runway Safety Action Team (RSAT) recommendations identified in the FY 2009 Airport Capital Improvement Program.
- Provide technical assistance for Master Plan studies in support of increasing the service volume at the 35 OEP airports.
- Continue work on EIS Study for project(s) selected under Executive Order 13274, Environmental Stewardship and Transportation Infrastructure Project Reviews.
- Monitor and maintain scheduled progress for Environmental Impact Statements at airports to enable airport capacity enhancing projects in congested metropolitan areas to proceed in a timely manner.
- Direct AIP funding to address up to 75 surveys and/or infrastructure needs in support of WAAS/LPV approaches.
- Continue support of Airports working group for NextGen.
- Continue work on Future Airport Capacity and Task (FACT) next steps and identify solutions at airports projected to have anticipated capacity shortfalls through 2025.
- Continue or complete regional studies to identify potential delay reduction measures.
- Commission new runways or runway extensions at Seattle-Tacoma, Washington Dulles, Philadelphia, and Chicago O'Hare International Airports.

- Provide AIP funding for OEP runways identified in the Airports Capital Improvement Program.
- Ensure approximately 20,000 people (residents and school students) in the Day-Light average sound level (DNL) 65dB (decibels) or greater receive benefits from noise compatibility projects funded under AIP.

FY 2010 Budget Request:

Safety-related development receives priority consideration for AIP funding. The FY 2010 request would allow the agency to continue supporting the following key initiatives:

Improvements to runway safety areas that do not conform to FAA standards: The agency's long-term goal is to eliminate airport conditions that contribute to accidents by improving RSAs. Since FY 2000, FAA has completed 324 RSA projects. As of September 2008, 129 RSAs remain to be upgraded. Thirty six RSAs will be brought up to standards or improved to the extent practicable in FY 2009. By 2010, eighty seven percent of practicable improvements will be completed, with all practicable improvements completed by 2015. RSA projects will continue to carry a high priority for obtaining AIP funding.

Runway incursion reduction: The FAA places a high priority on initiatives that reduce runway incursions. AIP funding will continue to be targeted to implement RSAT recommendations that reduce runway incursions. AIP funding will be used to install additional signs and lights, construct perimeter roads, reconfigure airport taxiways, increase training, and improve procedures.

Airport Safety Management System (SMS): FAA is implementing SMS at airports to harmonize with the International Civil Aviation Organization (ICAO) standard. An Airport SMS Advisory Circular (AC) was issued in FY 2007. With the issuance of the AC development of an airport's initial SMS plan/manual became eligible for funding under AIP planning grants. In addition, a pilot program was initiated to implement SMS at up to 20 airports in FY 2007. The pilot program was completed in June 2008 and will provide useful information as we proceed with an Airport SMS rulemaking action.

Infrastructure condition: The agency recognizes the safety benefits of ensuring that pavement, marking and lighting at airports identified in the National Plan of Integrated Airport Systems (NPIAS) meet current safety and design standards. AIP funding will be directed to ensure that 93 percent of runways at airports in the NPIAS are maintained in good or fair condition, ensure support of the Military Airport Program, develop reliever airports, and support research of airfield pavements to carry existing and new generation aircraft. AIP funding will continue to support this goal by funding: airport pavement and lighting system rehabilitation projects, treatments to minimize hydroplaning in wet conditions, obstruction removal in runway approach zones, perimeter fencing to prevent wildlife entry, and aircraft firefighting equipment. This also includes establishment of navigation aids (NAVAID) such as: instrument landing systems, runway end identifier lights, precision approach path indicators, and non-directional beacons to assist in approach and landing. The AIP and ATO capital programs share the same eligibility for funding NAVAID projects. AIP flexibility will continue to be used to maximize the funding of eligible NAVAID projects.

The agency has a special emphasis in directing AIP investments to reduce accidents in Alaska for general aviation and all Part 135 operations. AIP funding will be directed, where practical, to continue improving rural airports to provide at a minimum 24 hour Visual Flight Rules (VFR) access.

ARP will implement and provide outreach on the comprehensively updated Advisory Circular 150/5020-1 on Noise Control and Land Use Compatibility Planning.

ARP will continue to update and enhance the VALE (Voluntary Airport Low Emission) Program. This program provides opportunities for airports to reduce air emissions in areas that are in non-attainment for National Ambient Air Quality Standards or in areas designated as maintenance areas.

ARP will develop a Land Acquisition Airport Land Project Certification System (ALPCS) which will be a web-based project management system. Generally ALPCS will allow airport sponsors, property owners and displaced persons a project website location to fill out forms (claims for payments), receive explanations and for property owners to ask for help and contact. ALPCS is intended for small airport land projects that will typically be conducted by a single agent (either sponsor staff or consultant). ALPCS will improve the performance of the sponsor to document its compliance with Uniform Act requirements. It will also improve program delivery to property owners and displaced persons. FAA project managers will have a web interface to evaluate work for compliance to FAA and Uniform Act requirements, certification acceptance, grant management and close out, or to respond to inquiries. Current FAA oversight, grant initiation and close out processes are expected to be significantly improved and streamlined with the application of ALPCS on sponsor land projects.

ARP will undertake actions to expand the list of categorical exclusions under the National Environmental Policy Act (NEPA). This will assist in streamlining the environmental review process under NEPA by permitting certain additional FAA actions to be categorically excluded from environmental review rather than utilizing a more costly and longer environmental assessment process.

ARP will continue to expand on its Environmental Management System Program and awareness both at headquarters and throughout its field organization.

ARP will also undertake in FY 2010 a program evaluation regarding Streamlining the Environmental Impact Statement Process. This work item is identified in the *DOT Strategic Plan*.

The 35 airports included in the Operational Evolution Partnership (OEP) account for about 75 percent of all passenger enplanements. Much of the delay to air traffic can be traced to inadequate throughput at these airports. Airfield construction (new runways, runway extensions, new taxiways, end around perimeter taxiways, and airfield reconfigurations) is the most effective method of increasing throughput and reducing delay. Consequently, constructing new and/or extending runways, taxiways, and airfield reconfiguration are contained in the FAA's NextGen Implementation Plan (formerly OEP). Arrival and departure rates at the nation's busiest airports are constrained by the limited number of runways that can be in active use simultaneously. The addition of new and extended runways or airfield reconfigurations will expand airport throughput at the target airports, and possibly for other airports in the same metropolitan area. In most cases the airfield projects are sufficient to keep pace with forecasted demand. Since FY 2000, 15 new runways, two end-around perimeter taxiways, and one airfield reconfiguration have opened with another airfield reconfiguration two-thirds completed at the 35 OEP airports, allowing 1.9 million more annual operations. Currently, four OEP Airports have airfield projects (one new runway, one runway extension, one taxiway, and the third project in Phase 1 of the Chicago O'Hare Modernization) under construction. These projects will be commissioned through 2012 providing these airports with the potential to accommodate 110,900 more annual operations and reduce runway crossings. The complete listing of airfield projects included in the OEP is shown in the table below.

Airport	Anticipated Opening Date	Status
Philadelphia (Extension)	March 2009	Under construction
Chicago O'Hare (Reconfig.; Phase 1 w/3 projects)	September 2008 November 2008 2012	Opened (9R/27L Ext) Opened (9L/27R) Under Construction (10C/28C)
Boston Logan	November 2009	Under Construction
Charlotte	February 2010	Under construction

In addition eleven other OEP projects (three airfield reconfiguration, and eight new runway/ runway extensions) are currently in various stages of the planning and environmental processes. New projects are included in the OEP when the environmental processing has been completed, the Record of Decision has been issued, and the sponsor has provided the FAA with the dimensions, timing, alignment, and planned use of the runway. For details on these proposed projects, see the table below.

Airport or Metropolitan Area	Project	ROD will be Issued (Est.)	Status
Ft. Lauderdale	Extension	2009	ROD was completed in Dec 2008
Portland Int'l	Extension	2009	EA to be completed in Jan 2009
Atlanta Int'l	Extension	2009	Environmental underway
Philadelphia	Reconfiguration	2009	EIS underway.
Houston Intercontinental	New Runway	TBD	Planning underway.
Denver Int'l	New Runway	TBD	Study underway
Chicago O'Hare	Reconfiguration Phase 2	2005	ROD issued
Los Angeles	Reconfiguration – North Runway Complex	2005	ROD issued. Reconfiguration studies in progress.
Washington Dulles	New Runway	2005	ROD issued
Salt Lake City	Runway Extension	TBD	Begin planning around 2010
Tampa	Runway	TBD	Begin planning around 2013

For runways, runway extensions and airfield reconfigurations included in the NextGen Implementation Plan, a horizontal integration team was established, comprised of all involved FAA lines of business along with a military representative. The team develops a runway template action plan comprised of tasks that must be considered when commissioning that runway and assigns accountability to the airport, airline, and FAA. This allows for early identification and resolution of issues that might impact the runway schedule. Quarterly meetings are held with airport operators and airlines. The FAA provides vital technical and financial assistance for planning, environmental analysis, and construction/rehabilitation of runways, taxiways, and aprons as well as other measures to expand and make more efficient use of airports. AIP funding plan will reflect a special emphasis on increasing capacity and improving the airport arrival efficiency rate. AIP funding of the following airport projects contributes to these goals:

- Construct, rehabilitate or overlay existing runways, taxiways, and aprons.
- Extend runways, taxiways, and aprons.
- Construct/improve terminal buildings.
- Acquire and install visual approach aids.
- Acquire and install Instrument Landing Systems (ILS).
- Acquire and install weather-reporting equipment.
- Bring pavement and other facilities up to design standards.
- Construct new airports/heliport

ARP assesses the environmental impacts of proposed airport projects submitted for AIP and Passenger Facility Charge (PFC) program funding or other approval, and provides technical and funding support to mitigate impacts. Noise is still the impact of greatest concern, and the AIP and PFC programs provide funding to assist in abating the impacts of aircraft noise in the neighborhoods surrounding airports.

ARP strives to reduce undue delays in the environmental review of airport projects while maintaining the integrity of the environmental process and complying with all environmental protection requirements. ARP has streamlined environmental documentation requirements; undertaken actions to improve interagency coordination; issued revised environmental guidance for airport development; and has developed and utilizes recommended best practices for conducting environmental analysis and processing. In addition, efforts have been taken to integrate the airport planning and environmental processes. This will help streamline these processes and provide airport sponsors with opportunities for early input on both planning and environmental issues.

In FY 2010, ARP will continue to implement environmental streamlining provisions for capacity enhancement projects at congested airports, as specified by Congress in the Vision 100-Century of Aviation Reauthorization Act. Commissioning of new commercial service runways is dependent on the timely completion of environmental reviews. FAA staff will continue to apply new streamlining provisions of Executive Order 13274 on Environmental Stewardship and Transportation Infrastructure Project Reviews in order to facilitate the completion of designated airport projects.

After the identification of the impacted areas, often through AIP-funded studies, funding may help to purchase and relocate residences and businesses, soundproof residential homes or buildings used for educational or medical purposes, and purchase and install noise barriers or monitors. The AIP funding plan contributes to mitigating the harmful effects of aircraft noise for those living, working or going to school inside the significant aviation noise footprint. AIP funding will be provided for noise compatibility projects that benefit an expected population of 100,000 for FYs 2009 – 2013, measured on an annual basis with a rolling average of 20,000 per year. The annual population and school benefits is an "expected" number based on the number of residential units and schools specified in grant applications, census data on average household occupancy, and school records for school occupancy for the area.

The grants issued under the AIP also provide funding to airports for equipment and facilities used to control access to their critical operations areas. In order to receive funding, projects must have been identified in TSA-approved security plans for airports covered by Part 1542, Airport Security or at airports not covered by Part 1542 and having security requirements.

Security projects required by statute or regulation carry a high priority for AIP funding. Projects providing for the security of passengers and other persons in the terminal, as well as the terminal buildings themselves, are treated equally with projects to secure aircraft and the aircraft operations area. ARP will continue to work with both airport owners and TSA representatives in identifying security requirements and discussing appropriate funding sources. The most common type of security project supported by AIP funding is the installation of access control equipment. This includes perimeter fencing, security gates, security lighting, and cameras.

Explanation of Funding Changes for Grants-in-Aid for Airports

	Dollars ($000)	FTE
Grants-in-aid for Airports (Net change from FY 2009)	**-592,000**	**0**
Overview: For FY 2010, the Associate Administrator for Airports requires $3,384,106,000 to meet the mission of planning and developing a safe and efficient national airport system. This represents a decrease of $592,000 from the FY 2009 enacted level.		
Airport Improvement Program (AIP) Grants: The $3.384 billion requested for AIP will enable the FAA to meet all national priorities for safety, security and capacity and assure stable capital funding across all sizes of airports.	-592,000	0

Detailed Justification for Personnel & Related Expenses

Personnel & Related Expenses	FY 2010 Request: $93,422

Overview:

The Associate Administrator for Airports (ARP) provides leadership in planning and developing a safe and efficient national airport system to satisfy the needs of the aviation interests of the United States, with due consideration for economics, environmental compatibility, local proprietary rights, and safeguarding the public investment. The Management Staff (ARP-10) is the principal advisor to the associate administrator in the management and administrative requirements areas, provides the focal point for coordination, and represents the Associate Administrator in matters relating to planning and utilization of agency resources. The Office of Airport Safety and Standards (AAS) is the principal FAA organization responsible for all airport program matters pertaining to standards for airport design, construction, maintenance, operations, safety, and data, including ensuring adequacy of the substantive aspects of FAA rulemaking actions relating to the certification of airports. The Office of Airport Planning and Programming (APP) is the principal FAA organization responsible for all program matters pertaining to national airport planning and environmental requirements, airport grants, property transfers, passenger facility charges, and ensuring adequacy of the substantive aspects of FAA rulemaking actions relating to these programs. The Office of Airport Compliance and Field Operations (ACO-1), is responsible for ensuring compliance with Federal airport grant and surplus property obligations, and economic regulatory oversight and providing executive direction and oversight of regional activities. This office serves as the first level decision maker for adjudication of complaints filed against airports under 14 C.F.R Part 16. Additionally, this office has oversight of strategic management goals for field operations in coordination with headquarters policies and guidance.

FY 2009 Base:

ARP establishes regulations for safe operation of commercial service airports and regularly inspects certificated airports for compliance. In FY 2009, we are emphasizing efforts to continue the reduction in runway incursions caused by vehicle/pedestrian deviations. This will require ensuring airports maintain effective driver training programs as well as implementing approved Runway Safety Action Team recommendations. We also have a special emphasis program to accelerate improvements to runway safety areas that do not meet current standards. Another significant initiative is implementation of Safety Management Systems (SMS) at airports to harmonize with ICAO standards. Further, AIP provides priority consideration for funding safety-related development for airports that benefit both commercial service and general aviation operations.

In FY 2009, ARP will increase capacity at the 35 Operational Evolution Partnership (OEP) airports or major metropolitan areas by supporting, processing, and approving Airport Master Plans and Environmental Studies, directing funding investments toward capacity and delay reduction development, increasing the safety and capacity of the global civil aerospace system in an environmentally sound manner, and ensuring the success of its mission through stronger leadership, a better-trained workforce, a closer eye on spending, and improved decision-making based on reliable data.

Anticipated FY 2009 Accomplishments:

- Publish Advisory Circulars (AC) in FY 2009 that was contracted in FY 2008 or FY 2007.
- Award contracts for ACs in FY 2009 within 60 days of funds authorization as funding permits.
- Maintain average age of ACs at 5.0 years or less.
- Continue implementation of Airport Safety Management Systems (SMS).
- Manage and execute Part 139 Airport Safety Certification program.
- Meet Part 16 compliance schedules.
- The AAS and Regional team will conduct two on-site airport compliance inspections for revenue diversion by September 30, 2009.
- Each region will conduct at least two land use inspections at General Aviation airports by September 30, 2009.
- Support the Joint Planning Development Office by identifying and implementing operational improvements from CONOPS.

- Support the previous President's Management Agenda for E-Government by participating and providing resources to the Grants.gov and DOT grants portal initiative.
- Establish and implement ARP performance target for administering AIP based on identified Best Practices and Program Review.
- Administer the $3.5 billion AIP by issuing approximately 2,200 grants meeting FAA Flight Plan and ARP Business Plan performance targets.
- Close out 95 percent of grants, except those covered by extraordinary or unusual circumstances (litigation, SBG, etc.) issued for FY 2004 and prior years by September 30, 2009.
- Assure that no grants still open on September 30, 2009, will have been inactive for 18 months or more except for special circumstances (project in litigation, etc.).
- Issue 90 percent of grants (reported by number of grants) based on bids (for construction and equipment) by September 30, 2009.
- Fund WAAS/LPV surveys and/or infrastructure needs by September 30, 2009.

FY 2010 Budget Request:

FY 2010 funding will continue supporting the establishment and maintenance of high safety standards for U.S. airports. High standards reduce risks and contribute directly to a reduction in fatal accidents.

The requested increase will provide FTEs to support increased workload requirements on program managers as a result of the agency's implementation of Safety Management Systems (SMS) and increased Grants Management Oversight requirements. As part of the FAA's implementation of SMS, program managers in Airport District Offices will be required to participate in the preparation of Safety Risk Management Documents (SRMDs). SRMDs will be required for any changes to the National Airspace System including changes to airports such as new runways or taxiways. These airport projects will require study and analysis to identify risk, quantify risk, and develop and implement mitigation measures to reduce risk to acceptable levels. This will be a complex study for large airport projects. ARP representation on the teams developing SRMD documents is essential to ensure the proper risks are identified and the mitigation to reduce risk to acceptable levels does not impact capacity improvements expected from the airport projects. In addition, the program managers are needed to support new documentation requirements and Grants Management Oversight responsibilities established to enhance the internal controls of the Airport Improvement Program. The additional FTEs will help achieve clean audit of the AIP program by ensuring required grant documentation is collected and maintained in accordance with standardized grant documentation requirements.

Through the Airport Safety Data Program, the agency gathers information on all public-use airports for dissemination to pilots. The information is gathered by FAA's airport certification safety inspectors and through state inspectors funded by the agency. Information on the airport, such as lighting systems, pavement condition, runway lengths, and type of fuel available is entered into the National Flight Data Center database. The information is used to publish the Airport Facility Directory as well as for incorporation on aeronautical charts.

The FAA's engineering and technical support staff develops ACs and technical specifications. These technical documents provide airports with guidance on how to comply with airport safety regulations. ACs and technical specifications are maintained for areas such as airport signage, airport design and planning, airport rescue and firefighting, and on reducing wildlife hazards near airports. Regional engineers also review proposed airport safety and development projects.

ARP staff manages and executes the AIP grant program, providing funding for eligible Part 1542 security requirements identified in security plans approved by the Transportation Security Administration (TSA). ARP staff provides guidance on AIP eligibility, formulates the Airports Capital Improvement Program (ACIP) by identifying security needs, and works closely with the respective airport owners and TSA to fund eligible security requirements. The Office of Airports will continue to work with both airport owners and TSA representatives to identify security requirements and discuss appropriate funding sources.

ARP will provide vital technical and financial assistance for planning, environmental analysis, and construction, rehabilitation, or overlays of runways, taxiways, and aprons as well as other measures to expand and make more efficient use of airports. ARP staff actively participates in developing and maintaining the Runway Template Action Plan (RTAP) supporting the timely commissioning of the runways.

ARP staff will continue to ensure timely review of planning, environmental and financial efforts for infrastructure development with an emphasis on capacity enhancing projects.

ARP staff assesses the environmental impacts of proposed airport projects submitted for AIP funding or other approval, and provides technical and funding support to mitigate impacts. Noise and air quality are the impacts of greatest concern. The AIP and Passenger Facility Charge (PFC) programs provide funding to assist in abating the impacts of aircraft noise and emissions in the neighborhoods surrounding airports. In addition, ARP staff will continue to apply new streamlining provisions in both the Executive Order 13274 on Environmental Stewardship and Transportation Infrastructure Project Reviews and Vision 100 to OEP projects.

ARP also promotes improved international safety and regulatory oversight by participating in ICAO panels and workgroups and by providing technical assistance to countries seeking to improve airport safety and operations.

Explanation of Funding Changes for Personnel & Related Expenses

	Dollars ($000)	FTE
Personnel and Related Expenses (Net change from FY 2009)	**5,968**	**15**
Overview: For FY 2010, the Associate Administrator for Airports requires $93,422,000 and 542.5 FTEs to meet its mission of providing leadership in planning and developing a safe and efficient national airport system to satisfy the needs of the aviation interests of the United States, with due consideration for economics, environmental compatibility, local proprietary rights, and safeguarding the public investment. Covering the administrative expenses for the Office of Airports, this request represents an increase of $5,967,768 from the FY 2009 enacted level. The increase is due to a combination of several program increases, unavoidable pay raises, inflation, and discretionary increases.		
Annualized FTEs: This represents the net annualized costs of FY 2009 new hires and attrition.	1,129	7.5
Annualized FY 2009 Pay Raise: This pay raise has been calculated separately based on the employee population still under the General Schedule. This increase is needed to provide for the full-year cost associated with the 3.9 percent average government-wide pay raise in January 2009. The actual factor used is 4.8 (3.9 percent plus 0.9 percent average of Within-Grade increases). The FY 2009 portion of this pay raise will be absorbed within enacted amounts; this increase covers the first quarter of FY 2009.	945	
FY 2010 Organizational Success Increase (OSI): This pay raise has been calculated separately based on the employee population under the Core Compensation pay plan. This increase is required to provide for costs associated with base salary increases that are provided to employees meeting or exceeding job expectations. The factor used is 3.0 percent, composed of the projected 2.0 percent government-wide pay raise in January 2010 plus 1.0 percent for the full OSI increase (derived from the elimination of Within-Grade increases). A fundamental component of the FAA's pay-for-performance system, this increase assumes FAA will meet most of its FY 2009 performance goals.	1,537	
FY 2010 Superior Contribution Increase (SCI): This increase is required to provide for costs associated with base salary increases that are provided to employees in the Core Compensation system providing superior contributions to the	323	

	Dollars ($000)	**FTE**
organization. The factor used is 1.8 percent for 20 percent of the population and 0.6 percent for 45 percent of the population. The remaining 35 percent do not receive this increase.		
Non-Pay Inflation: This increase is needed to provide for inflationary cost increases consistent with OMB guidance that uses the FY 2010 GDP price index (year over year) of 0.5 percent.	96	
Airport Safety Management Systems (SMS): The requested increase will provide FTEs to support FAA in implementing Safety Management Systems including support and participation on teams developing Safety Risk Management Documents (SRMDs) that are required for any changes to the National Airspace System including changes to airports such as new runways or taxiways. In addition, the program managers are needed to support new documentation requirements and Grants Management Oversight responsibilities established to enhance the internal controls of the Airport Improvement Program. The additional FTEs will help achieve a clean audit of the AIP program by ensuring required grant documentation is collected and maintained in accordance with standardized grant documentation requirements. Under SMS, airport projects will require study and analysis to identify risk, quantify risk, and develop and implement mitigation measures to reduce risk to acceptable levels. This will be a complex study for large airport projects. ARP representation on the teams developing SRMD documents is essential to ensure the proper risks are identified and the mitigation to reduce risk to acceptable levels does not impact capacity improvements expected from the airport projects.	320	3.5
Wildlife Biologist: Currently FAA has only one wildlife biologist. This is inadequate to provide guidance and direction to airports on requirements for managing wildlife hazards on or near airports. This lack of staffing was most evident when FAA was without a wildlife biologist for almost one year due to retirement and difficulty in recruiting a replacement. The bird strikes that resulted in the U.S. Airways flight that ditched in the Hudson River after hitting a flock of geese highlight the importance of an effective wildlife management program.	80	0.5
Engineering Support (Electronic/Surveillance): An electronic engineer is requested that will be able to support the numerous airport surveillance systems that are under development or being installed at airports. Many of these systems are driven by radar or multilateration surveillance systems that are used to trigger automatic airport lighting and warning systems such as the Runway Status lights. The airport	80	0.5

	Dollars ($000)	FTE
engineering division does not have the expertise in radar based surveillance systems that lets us fully participate with the systems under development by the Air Traffic Organization. However, these systems must fully integrate with airport lighting systems that are specified within the Airports Line of Business.		
Airspace Staffing: Three positions are required to support the Airports airspace program. These positions would work with the three Air Traffic Service Centers to coordinate airspace analyses with ATO. We currently do not have enough personnel to effectively process airspace studies in a timely manner.	240	1.5
International Civil Aviation Organization (ICAO) Support (International Aviation Specialist): International activities continue to increase within the Airports Line of Business and we request one position and additional travel funds to meet our increasing international commitments. The Airports office is the U.S representative on the ICAO Aerodrome Panel. This is an important Panel that reviews and proposes changes to ICAO Standards and Recommended practices. We fully participate in the Panel activities to propose U.S. recommendations and review all proposed by other states. The Aerodrome Panel has workgroups on Airport Design, Aircraft Rescue and Firefighting, Visual Aids, heliports, and pavement. We must attend each of these work groups to advocate U.S interests as international standards are developed. Most workgroup meetings are held outside the U. S. and last one to two weeks, requiring expensive international travel. Airports are also supporting the Aviation Cooperative Programs with China and India and the U.S Safe Skies for Africa initiative, and reconstitution of civil aviation in Iraq and Afghanistan. Each of these requires international travel for our engineers and safety inspectors to meet commitments for FAA assistance to these countries. The position will coordinate all our international activities and make plans for foreign delegations visiting the U.S. It will also write remarks for ARP senior staff making presentations at foreign events.	180	0.5
Airport Planning and Geographic Information System (GIS) Staff: The FAA established a Flight Plan initiative to develop and implement an Airport GIS and electronic airport layout plans (e-ALPs). Electronic ALPs and Obstruction Charts will allow us to standardize the process of performing airport and aeronautical surveys and to produce them in an expedited and cost-effective manner. The new position would be responsible for providing information and guidance to FAA field offices concerning implementation/deployment, setting priorities, establishing an outreach workshop for internal and external users and ensuring that the ARP organization meets the Flight Plan goal in FY-10 and beyond. This is a critical national planning effort and will	80	0.5

	Dollars ($000)	**FTE**
require a full-time staff person to oversee the development and implementation of this effort.		
Certification Activity Tracking System (CATS) Database Development & Support: Improvements to CATS are required to add a Statistical Section on passenger airline activity to CATS. Both the Airports Council International and the Air Transport Association requested the FAA add this section to CATS for large and medium hub airports. The CATS Public Interface Screen is somewhat confusing and has not been updated since inception. An updated screen would significantly benefit all users. The current screen does not conform to the standard FAA "look" for internet screens. Users of the database have frequently expressed frustration by not being able to access the data recorded in the "other" lines on the financial report. The requested increase will provide contractor resources to make this data available.	100	
Private Airport Data Collection: Workload and staffing issues have not allowed us to collect airport data on approximately 14,000 private airports for more than 10 years. Funding is required to initiate a continuing program to collect the data by contract. Private airports are charted and it is important to maintain current data as pilots look for the closest available landing strip in emergencies. To limit the amount of data collected all at once that must be validated and processed into the national aeronautical database we plan to collect this data on private airports at a measured paced of one state per month. This will make the workload manageable and also provide a reasonable rate for updating private airport data.	300	
Document Scanning & Development Initiative: This request will be used to provide contract support to develop, electronically scan, and maintain all regional and headquarters paper documents into an electronic format accessible via a web interface. The Government Paperwork Elimination Act states Federal agencies should "maintain files electronically". In order to effectively and efficiently support this requirement, ARP requires a contractor. ARP's guiding principles in embarking on this initiative can be traced to OMB Circular A-130 which states several basic considerations and assumptions: Note: Excerpts from OMB Circular A-130 The Federal Government is the largest single producer, collector, consumer, and disseminator of information in the United States. Because of the extent of the government's information activities,	478	

	Dollars ($000)	FTE
and the dependence of those activities upon public cooperation, the management of Federal information resources is an issue of continuing importance to all Federal agencies, State and local governments, and the public. Systematic attention to the management of government records is an essential component of sound public resources management which ensures public accountability. Together with records preservation, it protects the government's historical record and guards the legal and financial rights of the government and the public. The availability of government information in diverse media, including electronic formats, permits agencies and the public greater flexibility in using the information.		
APP Information Technology Staff: An Information Technology Specialist is needed to support the increased information technology requirements necessary to comply with the provisions of the Clinger-Cohen Act, the Federal Funding Accountability and Transparency Act, the Paperwork Reduction Act, and the President's Management Agenda, (E-Government and E-Grants) new functionality, controls and reporting processes are being required from the information systems and organizations supported by these IT programs. The successful realization of investment returns, cost controls, schedule and performance goals, risk management plans and efficiencies have become high priority requirements along with the compliance with current mandates and guidelines for IT security, privacy, enterprise architecture, data standardization and assurance. Currently, the Airports Planning and Programming (APP) office has one Full Time Equivalent (FTE) assigned to these duties, in addition of to the role of System of Airport Reporting (SOAR) program manager, Systems Engineer and APP contracting officer technical representative. To support all these functions, processes and reporting requirements the Airports Planning and Programming (APP) office will require an additional FTE to perform these duties.	80	0.5

Detailed Justification for Airport Technology Research (ATR)

Airport Technology Research	FY 2010 Request: $22,472

Overview:

For FY 2010, research will be conducted in the areas of airport pavement, airport marking and lighting, airport rescue and firefighting, airport planning and design, wildlife hazard mitigation, and visual guidance. This research results in updates to ACs, manuals, and technical specifications that airports rely on when expending AIP funds.

FY 2009 Base:

FAA managers and engineering staff both at Headquarters and at the William J. Hughes Technical Center review projects proposed for research. The FAA's Research and Advisory Airport Subcommittee meets with FAA engineers and managers every six months to review research progress as well as the proposed future research requirements and priorities that are reflected in this submittal. The Subcommittee includes representatives from airports, aviation associations, aviation industry, aircraft manufacturers, and the Airline Pilots Association. This mix of airport users ensures that the research proposed is what the airport community needs and reflects their priorities.

The research conducted is producing significant benefits in increased safety and potential cost savings. For example, a GAO report in February 2002 estimated the costs to widen taxiways from 75 feet to 100 feet to meet the standard for new large aircraft such as the A-380 would be $509 million. As a result of research efforts that measured B-747 taxiway deviations at the John F. Kennedy and Anchorage airports, FAA was able to conduct a rigorous risk assessment that justified modification to standards that will permit operations of A-380 aircraft on existing 75-foot-wide taxiways with some conditions. This research project alone could avoid expenditure of hundreds of millions in AIP funds to unnecessarily widen taxiways. Other ongoing pavement research has produced a new pavement design procedure - FAA Rigid and Flexible Integrated Elastic Layered Design (FAARFIELD) - for thickness design, rehabilitation and overlay design using improved material specifications that promise to reduce pavement thickness while maintaining pavement life. New design procedures also promise to save hundreds of millions of dollars in pavement construction and rehabilitation.

In support of safety, research is being conducted in airport lighting and marking to improve pilot situational awareness and reduce runway incursions. Research in innovative methods to reduce the hazard of wildlife strikes to aircraft is also ongoing. Research results are published in a widely distributed manual that provides practical techniques for controlling wildlife near airports. The FAA is evaluating bird detection radar in a cooperative program with the Department of Defense and industry to provide real-time bird hazard data to airport users. Ongoing research is also conducted in aircraft rescue and firefighting and in the use of runway deicers and associated environmental issues.

Research also led to the development of engineered materials arresting systems (EMAS) that have been installed at more than 25 airports and have successfully safely stopped overrunning aircraft in four separate instances.

Anticipated FY 2009 Accomplishments:

- Complete study of Next Generation High Reach Extendible Turret.
- Complete validation of commercial avian radars.
- Complete evaluation of alternative runway groove shape on asphalt and concrete runway surfaces.
- Complete evaluation of camera based FOD detection systems at Boston Logan and Chicago O'Hare.
- Complete evaluation of a mobile FOD detection system at Chicago's Midway Airport.
- Complete evaluation of Taxiway Deviation data collection at Manchester, NH and West Palm Beach and Orlando, FL, and Chicago O'Hare.
- Complete phase 1 study of fire fighting agent quantities for NLA.

- Initiate full scale testing of composite fires at NLA Facility, Tyndall AFB, and Panama City, FL.
- Complete Report on New Photo luminescent Technology for Visible Surface Markings
- Evaluate effectiveness of a prototype alternative runway groove shape.
- Complete Study of Engineered Material Arresting System cold region freeze-thaw durability
- Complete Testing of Effects of Runway De/Anti-Icing Chemicals on Traction
- Initiate Experimentation on Alternative Arresting System Concepts
- Continue analyzing full-scale data from the NAPTF.
- Improve upon airport pavement thickness design package, including 3D finite element structural models, using FAARFIELD, an analytical program developed for the Agency.
- Complete a final report on rubblization of airfield pavements.
- Start development of a web-based application for airport pavement database management system.
- Develop models for airport funding strategies and passenger surveys.
- Continue full scale testing and analyze effects of sub grade quality and aircraft wheel gear spacing.
- Perform full scale testing and analyze effects of high tire pressure of aircraft wheels.

FY 2010 Budget Request:

The table below summarizes the research activities funded by this request. ($000)

Research Project	FY 2009*	FY 2010 Request	Increase/ Decrease
Contracts			
Advanced Airport Pavement Design	450	468	18
Pavement Design & Evaluation Methodology	900	936	36
National Airport Dynamic Tests	2,500	2,500	0
Field Instrumentation & Testing	540	750	210
Improved Paving Materials	1,100	1,350	250
Non-Destructive Pavement Testing	980	1,100	120
Pavement Roughness	420	437	17
Material Testing Laboratory	300	200	(100)
CEAT-University of Illinois	300	312	12
Airport Planning	350	364	14
Airport Design	700	728	28
Operation of NLA	800	800	0
Composite Materials Firefighting	616	453	(163)
Airport Wildlife Hazards Abatement	2,500	2,500	0
Airport Visual Guidance/Incursions Reduction	1,825	4,200	1,375
Soft Ground Systems Follow on	300	312	12
Surface Technology	1,000	1,000	0
Rescue and Fire Fighting	420	581	204
Subtotal—Contracts	**16,001**	**18,991**	**2,033**

TOTAL	**19,348**	**22,472**	**2,167**

The main increase for FY 2010 is $1,375,000 for visual aids to increase this item to a total of $3,200,000. The increase is required to start work on development of a visual aids test   For visual guidance we will start a multiyear initiative to develop a state of the art visual guidance technology test bed that would enable visual guidance engineers an opportunity to design, install, test, monitor, and report on what it will take to create a visual guidance infrastructure that will take full advantage of state of the art technologies in Signs, Lighting and Markings to provide a more efficient infrastructure and the best visual cues to the airport user.

Major advances in visual guidance technology have brought forth new brighter, more efficient and more conspicuous lighting devices, enhanced paint material that lasts longer than traditional paint, and airport signage that is easier to read from greater distances. This new technology, when compared with the current state of visual guidance systems, warrants that the FAA undertake a major research effort to enhance these essential systems, making improvements that will best serve the future of our nations aviation. The FAA's conceptual "NextGen" Program talks about levels of air traffic increasing to three times what it is today, bringing thousands and thousands of aircraft to smaller airports that have historically seen very little traffic. The demand for the visual guidance infrastructure at these airports will increase significantly, bringing with it higher levels of usage, higher performance requirements, and higher costs to maintain. Today's General Aviation community is already indicating that there is a need to enhance their visual aids, citing examples of aging power cables, antiquated fixtures, and high energy costs as major problems that they are experiencing now.

Explanation of Funding Changes for Airport Technology Research (ATR)

	Dollars ($000)	FTE
Airport Technology Research (Net change from FY 2009)	**3,124**	**1**
Overview: For FY 2010, the Associate Administrator for Airports requires 22,472,000 and 22.5 FTE to conduct research in the areas of airport pavement, airport marking and lighting, airport rescue and firefighting, airport planning and design, wildlife hazard mitigation, and visual guidance. This research results in updates to Advisory Circulars, manuals, and technical specifications that airports rely on when expending Airport Improvement Program (AIP) grant funds.		
Annualized FTEs: This represents the net annualized costs of FY 2009 new hires and attrition.	76	0.5
Annualized FY 2009 Pay Raise: This pay raise has been calculated separately based on the employee population still under the General Schedule. This increase is needed to provide for the full-year cost associated with the 3.9 percent average government-wide pay raise in January 2009. The actual factor used is 4.8 (3.9 percent plus 0.9 percent average of Within-Grade increases). The FY 2009 portion of this pay raise will be absorbed within enacted amounts; this increase covers the first quarter of FY 2009.	46	
FY 2010 Organizational Success Increase (OSI): This pay raise has been calculated separately based on the employee population under the Core Compensation pay plan. This increase is required to provide for costs associated with base salary increases that are provided to employees meeting or exceeding job expectations. The factor used is 3.0 percent, composed of the projected 2.0 percent government-wide pay raise in January 2010 plus 1.0 percent for the full OSI increase (derived from the elimination of Within-Grade increases). A fundamental component of the FAA's pay-for-performance system, this increase assumes FAA will meet most of its FY 2009 performance goals.	75	
FY 2010 Superior Contribution Increase (SCI): This increase is required to provide for costs associated with base salary increases that are provided to employees in the Core Compensation system providing superior contributions to the organization. The factor used is 1.8 percent for 20 percent of the population and 0.6 percent for 45 percent of the population. The remaining 35 percent do not receive this increase.	16	
Non-Pay Inflation:	80	

	Dollars ($000)	FTE
This increase is needed to provide for inflationary cost increases consistent with OMB guidance that uses the FY 2010 GDP price index (year over year) of 0.5 percent.		
Safety & Pavement Research: Engineering Specialist: The requested increase of $80 for an additional position (one half FTE) in FY 2010; will bring the total staffing in the Airport Technology Research Program to 23 positions and 22.5 FTE. The requested increase for an additional position is required because funding for the Airport Technology Research Program has increased dramatically, from approximately $5.0 million in FY 2000 to over $21.5 million in FY 2010. This combination of significantly increased funding and complexity of research projects requires additional engineering staff to effectively manage the work and ensure timely and high quality research products. Without the staffing increase, we anticipate possible project delays and missed opportunities in developing new methodologies, products, and collaboration with other organizations. Phase 1 of the Visual Test Bed. A $2,375,000 increase is requested for visual aids. The increase is required to start work on development of a visual aids test For visual guidance we will start a multiyear initiative to develop a state of the art visual guidance technology test bed that would enable visual guidance engineers an opportunity to design, install, test, monitor, and report on what it will take to create a visual guidance infrastructure that will take full advantage of state of the art technologies in Signs, Lighting and Markings to provide a more efficient infrastructure and the best visual cues to the airport user. Funding for phase 2 will be requested in FY 2011 ($2,000,000) and in FY 2012 for the final Phase 3 ($2,000,000).	2,831	0.5

Detailed Justification for Airport Cooperative Research Program (ACRP)

Airport Cooperative Research Program	FY 2010 Request: $ 15,000

Overview:

For FY 2010, FAA proposes to continue funding this program from the Grants-in-Aid for Airports appropriation and maintain the funding level at $15,000,000. ACRP was authorized by section 712 of Vision 100 – Century of Aviation Reauthorization Act.

FY 2009 Base:

The Secretary of Transportation signed the Memorandum of Agreement among DOT, FAA, and National Academy of Sciences to implement the ACRP. The Secretary also appointed the 13 members of the board of governors of the ACRP. The Transportation Research Board (TRB) of the National Academy is administering the program. The ACRP board of governors has met every 6 months to review progress and select additional topics to fund. Over 100 submitted topics will be reviewed at the July 2008 meeting and the most promising topics selected for contract award in FY 2009. The Board of Governors selects the highest rated topics, subject to the funds available, to proceed to contract solicitation and award. The TRB appoints expert technical panels for each selected project. The technical panels convert the topics into requests for proposals to select contractors to perform the research. The panels also monitor each project to ensure it stays on track and meets project deliverables.

The ACRP program is off to a good start. Over 90 research projects are underway. The first two studies were delivered in FY 2007.

Anticipated FY 2009 Accomplishments:

- ACRP Technical Panels monitor progress and deliverables on research projects awarded in FY 2008 and FY 2009.
- Board of Governors meets twice during FY 2009 to select projects to fund with the funds appropriated in FY 2009.
- TRB appoint project technical panels to monitor FY 2009 research projects awarded.

FY 2010 Budget Request:

The ACRP FY 2010 budget request is $15,000,000 as it was in the FY 09 enacted budget. We are requesting to hold the total the same as in FY 09 and not requesting mandatory or inflation increases. We will absorb these increases within the authorized level of $15,000,000. The ACRP Board of Governors will meet in July 2009 to select the most promising topics (more than 200 submitted) for funding in FY 2010.

Explanation of Funding Changes for Airport Cooperative Research Program (ACRP)

	Dollars ($000)	FTE
Airport Cooperative Research Program (Net change from FY 2009)	**0**	**0**
Overview: For FY 2010 we are maintaining the Airport Cooperative Research Program at the FY 2009 funding level of $15,000,000. There is a discretionary reduction in the contracts portions to offset unavoidable personnel increase.		
Annualized FY 2009 Pay Raise: This pay raise has been calculated separately based on the employee population still under the General Schedule. This increase is needed to provide for the full-year cost associated with the 3.9 percent average government-wide pay raise in January 2009. The actual factor used is 4.8 (3.9 percent plus 0.9 percent average of Within-Grade increases). The FY 2009 portion of this pay raise will be absorbed within enacted amounts; this increase covers the first quarter of FY 2009.	2	
FY 2010 Organizational Success Increase (OSI): This pay raise has been calculated separately based on the employee population under the Core Compensation pay plan. This increase is required to provide for costs associated with base salary increases that are provided to employees meeting or exceeding job expectations. The factor used is 3.0 percent, composed of the projected 2.0 percent government-wide pay raise in January 2010 plus 1.0 percent for the full OSI increase (derived from the elimination of Within-Grade increases). A fundamental component of the FAA's pay-for-performance system, this increase assumes FAA will meet most of its FY 2009 performance goals.	3	
FY 2010 Superior Contribution Increase (SCI): This increase is required to provide for costs associated with base salary increases that are provided to employees in the Core Compensation system providing superior contributions to the organization. The factor used is 1.8 percent for 20 percent of the population and 0.6 percent for 45 percent of the population. The remaining 35 percent do not receive this increase.	0.6	
Non-Pay Inflation: This increase is needed to provide for inflationary cost increases consistent with OMB guidance that uses the FY 2010 GDP price index (year over year) of 0.5 percent.	74	

	Dollars ($000)	FTE
ACRP Contracts Decrease: There is a discretionary reduction in contracts to offset unavoidable personnel increases.	-79	

AIRPORT IMPROVEMENT PROGRAM
Grants-in-Aid to Airports Planned Distribution
($000)
(Totals may not add due to rounding)

		FY 2008 Enacted	FY 2009 Enacted	FY 2010 Request
Formula Grants				
Primary Airports		839,731	849,424	849,424
Cargo Service Airports		118,829	118,464	118,444
Alaska		21,345	21,345	21,345
States (General Aviation)		679,022	676,940	676,821
Carryover (from Formula Grants)		467,909	622,545	622,545
	Subtotal, Formula Grants	2,126,836	2,288,718	2,288,579
Discretionary Grants				
Discretionary Set-Aside:	Noise Compatibility	275,112	207,470	207,311
Discretionary Set-Aside:	Reliever	5,188	3,912	3,909
Discretionary Set-Aside:	Military Airport Program	31,411	23,711	23,693
Discretionary Set-Aside:	Small/NonHub/GA Advanced	0	0	0
C/S/S/N		355,720	268,258	268,053
Pure Discretionary		118,573	89,419	89,352
	Subtotal, Discretionary Grants	786,036	592,770	592,318
Small Airport Fund		482,240	503,209	503,209
	Total Grants	**3,395,112**	**3,384,698**	**3,384,106**

AIRPORT IMPROVEMENT PROGRAM
Personnel and Related Expenses
($000)

The request for Personnel and Related Expenses under the Grants-in-Aid for Airports for FY 2010 is $93.422 million, an increase of $5.968 million from the FY 2009 level of $87.454 million. This increase is the result of unavoidable personnel increases of $4.030 million and discretionary increases of $1.938 million. Details on these discretionary increases can be found in the Explanation of Funding Changes table for Personnel and Related Expenses.

Summary Information

	EOY	FTE	Dollars ($000)
FY 2009 Enacted	535	527.5	87,454
FY 2010 Unavoidable Adjustments		7.5	4,030
FY 2010 Discretionary Increases	15	7.5	1,938
FY 2010 Proposed Program Level	**550**	**542.5**	**93,422**

FY 2010 Unavoidable Adjustments

	Dollars ($000)
1. Annualized FTE's	1,129
2. Annualized FY 2009 Pay Raise	945
3. FY 2010 Organizational Success Increase (OSI)	1,537
4. FY 2010 Superior Contribution Increase (SCI)	323
5. Non-Pay Inflation	96
Subtotal, Unavoidable Adjustments	**4,030**

FY 2010 Discretionary Increases

	Dollars ($000)
1. Airport Safety Management System (SMS) Specialist	320
2. Wildlife Biologist	80
3. Engineering Support (Electronic/Surveillance)	80
4. Airspace Staffing	240
5. ICAO Support (International Aviation Specialist)	180
6. Airport Planning and Geographic Information System (GIS Staff)	80
7. CATS Database Development & Support	100
8. Private Airport Data Collection	300
9. Document Scanning & Development Initiative	478
10. APP Information Technology Staff	80
Subtotal, Discretionary Increases	**1,938**

AIRPORT IMPROVEMENT PROGRAM
Airport Technology Research
($000)

The request for Airport Technology Research under the Grants-in-Aid for Airports for FY 2010 is $22.472 million, an increase of $3.124 million from the FY 2009 level. This increase is a result of a discretionary increase of $2.831 million, and annualization of the FTEs. Details on this discretionary increase can be found in the Explanation of Funding Changes table for Airport Technology Research.

Summary Information

	EOY	FTE	Dollars ($000)
FY 2009 Enacted	22	21.5	19,348
FY 2010 Unavoidable Adjustments....................		0.5	293
FY 2010 Discretionary Increases.......................	1	0.5	2,831
FY 2010 Program Level.............................	**23**	**22.5**	**22,472**

FY 2010 Unavoidable Adjustments

	Dollars ($000)
1. Annualized FTE's..	76
2. Annualized FY 2009 Pay Raise	46
3. FY 2010 Organizational Success Increase (OSI)	75
4. FY 2010 Superior Contribution Increase (SCI)..	16
5. Non-Pay Inflation..	80
Subtotal, Unavoidable Adjustments...	**293**

FY 2010 Discretionary Increases

	Dollars ($000)
1. Safety and Pavement Research..	2,831
Subtotal, Discretionary Increases	**2,831**

AIRPORT IMPROVEMENT PROGRAM

Airport Cooperative Research
($000)

The request for Airport Cooperative Research Program under the Grants-in-Aid for Airports for FY 2010 is $15.000 million. Details can be found in the Explanation of Funding Changes table for Airport Cooperative Research.

Summary Information

	EOY	FTE	Dollars ($000)
FY 2009 Enacted	1	1	15,000
FY 2010 Unavoidable Adjustments			0
FY 2010 Discretionary Increase			0
FY 2010 Proposed Program Level	**1**	**1**	**15,000**

FY 2010 Unavoidable Adjustments

	Dollars ($000)
1. Annualized FTE's	0
2. Annualized FY 2009 Pay Raise	2
3. FY 2010 Organizational Success Increase (OSI)	3
4. FY 2010 Superior Contribution Increase (SCI)	0.6
5. Non-Pay Inflation	74
6. ACRP Unavoidable Decrease	-80
Subtotal, Unavoidable Adjustments	**0**

FY 2010 Discretionary Increases

	Dollars ($000)
1. Airport Cooperative Research Program	0
Subtotal, Discretionary Increases	**0**

Passenger Facility Charge (PFC) Approved Locations

As of March 31st, 2009
(Whole Dollars)

PFC APPROVED LOCATIONS
Locations approved to collect at a $4.50 PFC level are indicated by shaded row.

Associated City	State	Airport Name	LOC ID	Hub size	Level	Total Approved	Duration	Start Date	Est. Expir. Date
Birmingham	AL	Birmingham International	BHM	S	$3.00	$24,548,436	6y3m	8/1/1997	11/1/2003
Birmingham	AL	Birmingham International	BHM	S	$3.00	$21,560,387	4y10m	12/1/2003	10/1/2008
Birmingham	AL	Birmingham International	BHM	S	$4.50	$15,173,639	1y5m	10/1/2008	3/1/2010
Dothan	AL	Dothan Regional	DHN	N	$3.00	$5,515,948	3y6m	2/1/1998	8/1/2001
Dothan	AL	Dothan Regional	DHN	N	$4.50	**	19y4m	8/1/2001	12/1/2020
Huntsville	AL	Huntsville International - Carl T. Jones Field	HSV	S	$3.00	$18,210,896	12y3m	6/1/1992	9/1/2004
Huntsville	AL	Huntsville International - Carl T. Jones Field	HSV	S	$4.50	$13,629,033	5y8m	9/1/2004	5/1/2010
Mobile	AL	Mobile Regional	MOB	N	$3.00	$4,715,747	6y7m	12/1/1997	7/1/2004
Mobile	AL	Mobile Regional	MOB	N	$3.00	$7,672,849	6y11m	3/1/2005	2/1/2012
Montgomery	AL	Montgomery Regional (Dannelly Field)	MGM	N	$4.50	$28,599,933	21y8m	5/1/2005	1/1/2027
Muscle Shoals	AL	Northwest Alabama Regional	MSL	CS	$3.00	$267,600	11y4m	6/1/1992	10/1/2003
Muscle Shoals	AL	Northwest Alabama Regional	MSL	CS	$3.00	$57,355	4y5m	12/1/2004	4/1/2009
Muscle Shoals	AL	Northwest Alabama Regional	MSL	CS	$4.50	$120,000	4y	4/1/2009	4/1/2013
Anchorage	AK	Ted Stevens Anchorage International	ANC	M	$3.00	$33,000,000	14y9m	10/1/2000	7/1/2015
Fairbanks	AK	Fairbanks International	FAI	S	$3.00	$5,196,252	3y6m	10/1/2000	4/1/2004
Fairbanks	AK	Fairbanks International	FAI	S	$4.50	**	2y6m	4/1/2004	10/1/2006
Fairbanks	AK	Fairbanks International	FAI	S	$4.50	$33,217,000	20y	10/1/2006	10/1/2026
Juneau	AK	Juneau International	JNU	N	$3.00	$1,520,391	2y4m	10/1/1998	2/1/2001
Juneau	AK	Juneau International	JNU	S	$4.50	$9,817,616	16y3m	8/1/2001	11/1/2017
Ketchikan	AK	Ketchikan International	KTN	N	$3.00	$6,644,400	2y6m	2/1/1999	8/1/2001
Ketchikan	AK	Ketchikan International	KTN	N	$4.50	**	16y8m	8/1/2001	4/1/2018
Sitka	AK	Sitka Rocky Gutierrez	SIT	N	$4.50	$1,100,000	4y11m	7/1/2007	6/1/2012
Pago Pago	AS	Pago Pago International	PPG	N	$3.00	$1,236,306	4y11m	7/1/1995	6/1/2000
Pago Pago	AS	Pago Pago International	PPG	N	$4.50	$765,000	4y	9/1/2001	9/1/2005
Pago Pago	AS	Pago Pago International	PPG	N	$4.50	$5,848,954	14y6m	6/1/2006	12/1/2020
Bullhead City	AZ	Laughlin/Bullhead International	IFP	N	$2.00	$744,600	4y2m	5/1/2008	7/1/2012
Flagstaff	AZ	Flagstaff Pulliam	FLG	N	$3.00	$2,463,581	22y1m	12/1/1992	1/1/2015
Mesa	AZ	Phoenix-Mesa Gateway	IWA/AZA	N	$4.50	$3,585,510	4y3m	11/1/2008	2/1/2013
Peach Springs	AZ	Grand Canyon West	1G4/PGS	N	$3.00	$308,210	2y	9/1/2004	9/1/2006
Peach Springs	AZ	Grand Canyon West	1G4/PGS	N	$3.00	$9,614,736	15y7m	6/1/2008	1/1/2024
Phoenix	AZ	Phoenix Sky Harbor International	PHX	L	$3.00	$300,411,920	6y	4/1/1996	4/1/2002
Phoenix	AZ	Phoenix Sky Harbor International	PHX	L	$4.50	$645,852,900	10y1m	7/1/2002	8/1/2010
Tucson	AZ	Tucson International	TUS	M	$3.00	$100,461,860	8y8m	2/1/1998	10/1/2006
Tucson	AZ	Tucson International	TUS	M	$4.50	**	6y6m	10/1/2006	4/1/2013

Tucson	AZ	Tucson International	TUS	M	$4.50	$44,194,512	4y5m	4/1/2013	9/1/2017
Yuma	AZ	Yuma MCAS/Yuma International	NYL/YUM	N	$3.00	$2,390,423	12y10m	12/1/1993	10/1/2005
Yuma	AZ	Yuma MCAS/Yuma International	NYL/YUM	N	$4.50	**	1y6m	10/1/2005	4/1/2007
Yuma	AZ	Yuma MCAS/Yuma International	NYL/YUM	N	$4.50	$2,407,035	9y8m	11/1/2007	7/1/2017
Bentonville	AR	Northwest Arkansas Regional	XNA	S	$3.00	$125,005,518	2y4m	12/1/1998	4/1/2001
Bentonville	AR	Northwest Arkansas Regional	XNA	S	$4.50	**	39y2m	4/1/2001	6/1/2040
Fayetteville	AR	Drake Field	FYV		$3.00	$2,221,887	5y	1/1/1996	1/1/2001
Fort Smith	AR	Fort Smith Regional	FSM	N	$3.00	$4,088,371	13y6m	8/1/1994	2/1/2008
Fort Smith	AR	Fort Smith Regional	FSM	N	$4.50	**	1y2m	2/1/2008	4/1/2009
Fort Smith	AR	Fort Smith Regional	FSM	N	$4.50	$1,250,000	3y	4/1/2009	4/1/2012
Little Rock	AR	Adams Field	LIT	S	$3.00	$24,383,919	6y4m	5/1/1995	9/1/2001
Little Rock	AR	Adams Field	LIT	S	$4.50	$53,743,837	10y2m	9/1/2001	11/1/2011
Texarkana	AR	Texarkana Regional-Webb Field	TXK	N	$3.00	$649,532	6y7m	2/1/1995	9/1/2001
Texarkana	AR	Texarkana Regional-Webb Field	TXK	N	$4.50	$258,861	3y6m	9/1/2001	3/1/2005
Texarkana	AR	Texarkana Regional-Webb Field	TXK	N	$4.50	$564,071	1y9m	7/1/2008	4/1/2010
Arcata/Eureka	CA	Arcata	ACV	N	$3.00	$169,564	1y1m	2/1/1993	3/1/1994
Arcata/Eureka	CA	Arcata	ACV	N	$3.00	$594,758	3y	11/1/1994	11/1/1997
Arcata/Eureka	CA	Arcata	ACV	N	$3.00	$1,482,300	5y2m	4/1/1998	6/1/2003
Arcata/Eureka	CA	Arcata	ACV	N	$4.50	$671,450	1y9m	6/1/2003	3/1/2005
Arcata/Eureka	CA	Arcata	ACV	N	$4.50	$392,265	3m	7/1/2005	10/1/2005
Arcata/Eureka	CA	Arcata	ACV	N	$4.50	*	4m	12/1/2005	4/1/2006
Arcata/Eureka	CA	Arcata	ACV	N	$4.50	$2,435,350	5y1m	4/1/2006	5/1/2011
Bakersfield	CA	Meadows Field	BFL	N	$3.00	$1,562,876	6y11m	6/1/1995	5/1/2002
Bakersfield	CA	Meadows Field	BFL	N	$4.50	$9,086,000	12y8m	5/1/2002	1/1/2015
Burbank	CA	Bob Hope	BUR	M	$3.00	$107,029,194	8y7m	9/1/1994	4/1/2003
Burbank	CA	Bob Hope	BUR	M	$4.50	**	4y9m	4/1/2003	1/1/2008
Burbank	CA	Bob Hope	BUR	M	$4.50	$58,918,951	5y3m	1/1/2008	4/1/2013
Carlsbad	CA	McCellan-Palomar	CRQ/CLD	N	$4.50	$4,947,065	34y1m	1/1/2009	2/1/2043
Chico	CA	Chico Municipal	CIC	N	$3.00	$232,643	4y9m	12/1/1993	9/1/1998
Chico	CA	Chico Municipal	CIC	N	$3.00	$25,000	1y8m	6/1/1999	2/1/2001
Chico	CA	Chico Municipal	CIC	N	$3.00	$536,747	8y1m	11/1/2001	12/1/2009
Crescent City	CA	Jack McNamara Field	CEC	N	$3.00	$58,330	1y9m	9/1/1998	6/1/2000
Crescent City	CA	Jack McNamara Field	CEC	N	$3.00	$223,807	2y5m	1/1/2001	6/1/2003
Crescent City	CA	Jack McNamara Field	CEC	N	$4.50	**	3y10m	6/1/2003	4/1/2007
Crescent City	CA	Jack McNamara Field	CEC	N	$4.50	$253,123	5y5m	4/1/2007	9/1/2012
Fresno	CA	Fresno Yosemite International	FAT	S	$3.00	$55,936,482	8y	12/1/1996	12/1/2004
Fresno	CA	Fresno Yosemite International	FAT	S	$4.50	**	15y1m	12/1/2004	1/1/2020
Imperial	CA	Imperial County	IPL	N	$4.50	$892,781	9y	4/1/2003	4/1/2012
Inyokern	CA	Inyokern	IYK	N	$3.00	$395,852	10y	3/1/1993	3/1/2003
Inyokern	CA	Inyokern	IYK	N	$3.00	$51,000	6m	4/1/2004	10/1/2004
Inyokern	CA	Inyokern	IYK	N	$4.50	$89,999	2y5m	9/1/2006	2/1/2009
Inyokern	CA	Inyokern	IYK	N	$4.50	$502,105	10y	3/1/2009	3/1/2019
Long Beach	CA	Long Beach/Daugherty Field	LGB	S	$3.00	$69,493,089	4y9m	8/1/2003	5/1/2008
Long Beach	CA	Long Beach/Daugherty Field	LGB	S	$4.50	**	7y6m	5/1/2008	11/1/2015
Long Beach	CA	Long Beach/Daugherty	LGB	S	$4.50	$69,137,000	9y10m	11/1/2015	9/1/2025

		Field							
Los Angeles	CA	Los Angeles International	LAX	L	$3.00	$166,593,784	2y6m	7/1/1993	1/1/1996
Los Angeles	CA	Los Angeles International	LAX	L	$3.00	$700,000,000	5y5m	2/1/1998	7/1/2003
Los Angeles	CA	Los Angeles International	LAX	L	$4.50	**	2y5m	7/1/2003	12/1/2005
Los Angeles	CA	Los Angeles International	LAX	L	$4.50	$782,779,968	6y1m	12/1/2005	1/1/2012
Mammoth Lakes	CA	Mammoth Lakes	MMH		$3.00	$166,632	10y	9/1/1995	9/1/2005
Modesto	CA	Modesto City County-Harry Sham Field	MOD	N	$3.00	$400,757	10y7m	8/1/1994	3/1/2005
Modesto	CA	Modesto City County-Harry Sham Field	MOD	N	$4.50	$395,134	7y4m	8/1/2008	12/1/2015
Monterey	CA	Monterey Peninsula	MRY	N	$3.00	$5,617,846	9y6m	1/1/1994	7/1/2003
Monterey	CA	Monterey Peninsula	MRY	N	$4.50	$2,199,929	2y9m	7/1/2003	4/1/2006
Monterey	CA	Monterey Peninsula	MRY	N	$4.50	$3,010,052	3y3m	5/1/2006	8/1/2009
Oakland	CA	Metropolitan Oakland International	OAK	M	$3.00	$64,407,665	6y9m	9/1/1992	6/1/1999
Oakland	CA	Metropolitan Oakland International	OAK	M	$3.00	$77,631,844	3y8m	9/1/1999	5/1/2003
Oakland	CA	Metropolitan Oakland International	OAK	M	$4.50	**	4m	5/1/2003	9/1/2003
Oakland	CA	Metropolitan Oakland International	OAK	M	$4.50	$204,885,000	7y6m	9/1/2003	3/1/2011
Ontario	CA	Ontario International	ONT	M	$3.00	$27,333,931	3y5m	7/1/1993	12/1/1996
Ontario	CA	Ontario International	ONT	M	$3.00	$118,454,000	9y4m	7/1/1998	11/1/2007
Ontario	CA	Ontario International	ONT	M	$4.50	$96,648,998	5y6m	11/1/2007	5/1/2013
Oxnard	CA	Oxnard	OXR	N	$4.50	$872,000	9y2m	1/1/2002	3/1/2011
Palm Springs	CA	Palm Springs International	PSP	S	$3.00	$88,415,656	9y4m	9/1/1992	1/1/2002
Palm Springs	CA	Palm Springs International	PSP	S	$4.50	**	27y6m	1/1/2002	7/1/2029
Redding	CA	Redding Municipal	RDD	N	$3.00	$1,009,264	5y	4/1/1997	4/1/2002
Redding	CA	Redding Municipal	RDD	N	$4.50	**	8m	4/1/2002	12/1/2002
Redding	CA	Redding Municipal	RDD	N	$4.50	$1,251,567	4y4m	12/1/2002	4/1/2007
Redding	CA	Redding Municipal	RDD	N	$4.50	$809,295	3y1m	8/1/2007	9/1/2010
Sacramento	CA	Sacramento International	SMF	M	$3.00	$112,695,090	8y9m	4/1/1993	1/1/2002
Sacramento	CA	Sacramento International	SMF	M	$4.50	**	1y1m	1/1/2002	2/1/2003
Sacramento	CA	Sacramento International	SMF	M	$3.00	$163,923,407	6m	2/1/2003	9/1/2003
Sacramento	CA	Sacramento International	SMF	M	$4.50	**	7y6m	9/1/2003	3/1/2011
Sacramento	CA	Sacramento International	SMF	M	$4.50	$614,638,874	16y11m	3/1/2011	2/1/2028
San Diego	CA	San Diego International	SAN	L	$3.00	$149,301,528	7y10m	10/1/1995	8/1/2003
San Diego	CA	San Diego International	SAN	L	$4.50	$219,442,062	6y2m	8/1/2003	10/1/2009
San Francisco	CA	San Francisco International	SFO	L	$4.50	$833,142,518	15y3m	10/1/2001	1/1/2017
San Jose	CA	Norman Y. Mineta San Jose International	SJC	M	$3.00	$170,616,235	8y7m	9/1/1992	4/1/2001
San Jose	CA	Norman Y. Mineta San Jose International	SJC	M	$4.50	**	2y	4/1/2001	4/1/2003
San Jose	CA	Norman Y. Mineta San Jose International	SJC	M	$4.50	$923,171,136	26y1m	4/1/2003	5/1/2029
San Luis Obispo	CA	San Luis County Regional	SBP	N	$3.00	$615,677	2y	2/1/1993	2/1/1995
San Luis Obispo	CA	San Luis County Regional	SBP	N	$3.00	$7,432,277	7y3m	6/1/1995	9/1/2002
San Luis Obispo	CA	San Luis County Regional	SBP	N	$4.50	**	11y10m	9/1/2002	7/1/2012
San Luis Obispo	CA	San Luis County Regional	SBP	N	$3.00	$1,040,111	3y	7/1/2012	7/1/2015
San Luis Obispo	CA	San Luis County Regional	SBP	N	$4.50	$3,681,070	6y6m	7/1/2015	1/1/2022

Santa Ana	CA	John Wayne Airport - Orange County	SNA	M	$4.50	$321,351,002	15y6m	7/1/2006	1/1/2022
Santa Barbara	CA	Santa Barbara Municipal	SBA	S	$3.00	$9,499,365	4y10m	1/1/1998	11/1/2003
Santa Barbara	CA	Santa Barbara Municipal	SBA	S	$4.50	**	2y3m	11/1/2003	2/1/2006
Santa Barbara	CA	Santa Barbara Municipal	SBA	S	$4.50	$6,944,000	3y8m	2/1/2006	10/1/2009
Santa Maria	CA	Santa Maria Public/Capt G Allan Hancock Field	SMX	N	$4.50	$5,380,346	21y	10/1/2007	10/1/2028
Santa Rosa	CA	Charles M. Schultz - Sonoma County	STS	N	$3.00	$719,797	7y11m	5/1/1993	4/1/2001
Santa Rosa	CA	Charles M. Schultz - Sonoma County	STS	N	$4.50	**	4y	4/1/2001	4/1/2005
Santa Rosa	CA	Charles M. Schultz - Sonoma County	STS	N	$4.50	$1,594,049	3y9m	5/1/2008	2/1/2012
South Lake Tahoe	CA	Lake Tahoe	TVL		$3.00	$928,747	14y7m	8/1/1992	3/1/2007
Stockton	CA	Stockton Metropolitan	SCK	N	$4.50	$322,665	2y6m	2/1/2007	8/1/2009
Alamosa	CO	San Luis Valley Regional/Bergman Field	ALS	CS	$3.00	$288,836	27y2m	3/1/1997	5/1/2024
Aspen	CO	Aspen-Pitkin County/Sardy Field	ASE	N	$3.00	$3,869,200	7y10m	7/1/1995	5/1/2003
Aspen	CO	Aspen-Pitkin County/Sardy Field	ASE	N	$4.50	$713,146	1y3m	5/1/2003	8/1/2004
Aspen	CO	Aspen-Pitkin County/Sardy Field	ASE	N	$4.50	$4,352,162	5y7m	1/1/2005	8/1/2010
Colorado Springs	CO	City of Colorado Springs Municipal	COS	S	$3.00	$68,549,298	20y9m	3/1/1993	12/1/2013
Cortez	CO	Cortez Municipal	CEZ	N	$3.00	$200,078	8y4m	11/1/1999	3/1/2008
Cortez	CO	Cortez Municipal	CEZ	N	$4.50	$339,072	8y	3/1/2008	3/1/2016
Denver	CO	Denver International	DEN	L	$3.00	$3,137,099,200	8y9m	7/1/1992	4/1/2001
Denver	CO	Denver International	DEN	L	$4.50	**	25y9m	4/1/2001	1/1/2026
Denver	CO	Denver International	DEN	L	$4.50	$80,386,000	3y1m	1/1/2026	2/1/2029
Durango	CO	Durango-La Plata County	DRO	N	$3.00	$534,282	2y6m	2/1/1995	8/1/1997
Durango	CO	Durango-La Plata County	DRO	N	$3.00	$1,289,455	5y6m	9/1/1997	3/1/2003
Durango	CO	Durango-La Plata County	DRO	N	$4.50	$3,130,691	5y10m	6/1/2005	4/1/2011
Eagle	CO	Eagle County Regional	EGE	N	$3.00	$8,855,961	7y7m	9/1/1993	4/1/2001
Eagle	CO	Eagle County Regional	EGE	N	$4.50	**	8y2m	4/1/2001	6/1/2009
Eagle	CO	Eagle County Regional	EGE	N	$3.00	$300,000	1m	6/1/2009	7/1/2009
Eagle	CO	Eagle County Regional	EGE	N	$4.50	$13,713,255	15y	7/1/2009	7/1/2024
Fort Collins-Loveland	CO	Fort Collins-Loveland Municipal	FNL	N	$3.00	$307,046	5y7m	10/1/1993	5/1/1999
Fort Collins-Loveland	CO	Fort Collins-Loveland Municipal	FNL	N	$4.50	$705,884	5y3m	8/1/2004	11/1/2009
Grand Junction	CO	Grand Junction Regional	GJT	N	$3.00	$4,879,574	13y5m	4/1/1993	9/1/2006
Grand Junction	CO	Grand Junction Regional	GJT	N	$4.50	$8,330,000	16y11m	9/1/2006	8/1/2023
Gunnison	CO	Gunnison-Crested Butte Regional	GUC	N	$3.00	$1,089,036	7y5m	11/1/1993	4/1/2001
Gunnison	CO	Gunnison-Crested Butte Regional	GUC	N	$4.50	$2,758,804	13y2m	4/1/2001	6/1/2014
Hayden	CO	Yampa Valley	HDN	N	$3.00	$2,190,009	7y8m	11/1/1993	7/1/2001
Hayden	CO	Yampa Valley	HDN	N	$4.50	**	7m	7/1/2001	2/1/2002
Hayden	CO	Yampa Valley	HDN	N	$4.50	$6,115,140	13y7m	2/1/2002	9/1/2015
Montrose	CO	Montrose Regional	MTJ	N	$3.00	$1,422,535	9y9m	11/1/1993	8/1/2003
Montrose	CO	Montrose Regional	MTJ	N	$4.50	$821,694	2y10m	8/1/2003	6/1/2006
Montrose	CO	Montrose Regional	MTJ	N	$4.50	$1,386,487	4y	8/1/2006	8/1/2010
Pueblo	CO	Pueblo Memorial	PUB	CS	$3.00	$395,322	21y1m	11/1/1993	12/1/2014
Steamboat Springs	CO	Steamboat Springs/Bob Adams	SBS		$3.00	$159,576	4y2m	4/1/1993	6/1/1997

Telluride	CO	Telluride Regional	TEX	N	$3.00	$778,287	9y2m	2/1/1993	4/1/2002
Telluride	CO	Telluride Regional	TEX	N	$4.50	$6,268,750	16y9m	4/1/2002	1/1/2019
New Haven	CT	Tweed-New Haven	HVN	N	$3.00	$983,636	4y4m	12/1/1993	4/1/1998
New Haven	CT	Tweed-New Haven	HVN	N	$4.50	$572,848	3y9m	10/1/2001	7/1/2005
New Haven	CT	Tweed-New Haven	HVN	N	$4.50	$1,158,509	5y5m	5/1/2006	10/1/2011
Windsor Locks	CT	Bradley International	BDL	M	$3.00	$9,257,000	2y2m	10/1/1993	12/1/1995
Windsor Locks	CT	Bradley International	BDL	M	$3.00	$3,263,971	6m	7/1/1996	1/1/1997
Windsor Locks	CT	Bradley International	BDL	M	$3.00	$27,749,445	2y11m	9/1/1997	8/1/2000
Windsor Locks	CT	Bradley International	BDL	M	$4.50	$257,534,407	14y10m	5/1/2001	3/1/2016
Windsor Locks	CT	Bradley International	BDL	M	$3.00	$4,152,000	6m	3/1/2016	9/1/2016
Windsor Locks	CT	Bradley International	BDL	M	$4.50	$2,374,574	2m	9/1/2016	11/1/2016
Daytona Beach	FL	Daytona Beach International	DAB	N	$3.00	$29,469,817	8y1m	7/1/1993	8/1/2001
Daytona Beach	FL	Daytona Beach International	DAB	N	$3.00	*	3y8m	2/1/2002	11/1/2005
Daytona Beach	FL	Daytona Beach International	DAB	N	$4.50	**	14y4m	11/1/2005	3/1/2020
Fort Lauderdale	FL	Fort Lauderdale/Hollywood International	FLL	L	$3.00	$228,064,335	10y10m	1/1/1995	10/1/2005
Fort Lauderdale	FL	Fort Lauderdale/Hollywood International	FLL	L	$4.50	$455,852,573	7y	10/1/2005	10/1/2012
Fort Myers	FL	Southwest Florida International	RSW	M	$3.00	$109,252,734	11y	11/1/1992	11/1/2003
Fort Myers	FL	Southwest Florida International	RSW	M	$4.50	**	2y10m	11/1/2003	9/1/2006
Fort Myers	FL	Southwest Florida International	RSW	M	$4.50	$137,410,598	8y5m	9/1/2006	2/1/2015
Gainsville	FL	Gainsville Regional	GNV	N	$3.00	$484,900	1y7m	7/1/2000	2/1/2002
Gainsville	FL	Gainsville Regional	GNV	N	$4.50	$4,637,954	8y1m	1/1/2003	2/1/2011
Jacksonville	FL	Jacksonville International	JAX	M	$3.00	$40,141,463	9y1m	4/1/1994	5/1/2003
Jacksonville	FL	Jacksonville International	JAX	M	$4.50	$332,610,893	19y9m	5/1/2003	2/1/2023
Key West	FL	Key West International	EYW	N	$3.00	$1,922,283	3y5m	3/1/1993	8/1/1996
Key West	FL	Key West International	EYW	N	$3.00	$4,272,834	5y7m	12/1/1997	6/1/2003
Key West	FL	Key West International	EYW	N	$4.50	$2,043,950	2y1m	6/1/2003	7/1/2005
Key West	FL	Key West International	EYW	N	$4.50	$49,283,306	32y5m	10/1/2005	3/1/2038
Marathon	FL	Marathon	MTH		$3.00	$390,001	5y3m	3/1/1993	6/1/1998
Melbourne	FL	Melbourne International	MLB	N	$3.00	$11,080,917	20y4m	5/1/1997	9/1/2017
Miami	FL	Miami International	MIA	L	$3.00	$337,041,000	7y2m	11/1/1994	1/1/2002
Miami	FL	Miami International	MIA	L	$4.50	**	1y2m	1/1/2002	3/1/2003
Miami	FL	Miami International	MIA	L	$4.50	$2,420,400,341	34y7m	3/1/2003	10/1/2037
Naples	FL	Naples Municipal	APF	N	$3.00	$899,685	6y	2/1/1995	2/1/2001
Naples	FL	Naples Municipal	APF	N	$3.00	$91,651	2y3m	2/1/2002	5/1/2004
Orlando	FL	Orlando International	MCO	L	$3.00	$550,351,180	14y2m	2/1/1993	4/1/2007
Orlando	FL	Orlando International	MCO	L	$4.50	$1,071,167,204	12y8m	4/1/2007	12/1/2019
Orlando	FL	Orlando International	MCO	L	$3.00	$48,580,000	7m	12/1/2019	7/1/2020
Orlando	FL	Orlando Sandford International	SFB	S	$1.00	$1,192,352	2y9m	3/1/2001	12/1/2003
Orlando	FL	Orlando Sandford International	SFB	S	$2.00	$13,312,090	10y7m	12/1/2003	7/1/2014
Panama City	FL	Panama City - Bay County International	PFN	N	$3.00	$8,238,499	10y3m	2/1/1994	5/1/2004
Panama City	FL	Panama City - Bay County International	PFN	N	$4.50	**	4y11m	5/1/2004	4/1/2009
Panama City	FL	Panama City - Bay County International	PFN	N	$4.50	$41,968,640	30y3m	4/1/2009	7/1/2039
Pensacola	FL	Penscola Regional	PNS	S	$3.00	$24,954,478	9y10m	2/1/1993	12/1/2002

Pensacola	FL	Penscola Regional	PNS	S	$4.50	**	4y9m	12/1/2002	9/1/2007
Pensacola	FL	Penscola Regional	PNS	S	$4.50	$119,534,914	23y1m	9/1/2007	10/1/2031
Sarasota	FL	Sarasota/Bradenton International	SRQ	S	$3.00	$60,882,956	9y8m	9/1/1992	5/1/2002
Sarasota	FL	Sarasota/Bradenton International	SRQ	S	$4.50	**	11y9m	5/1/2002	2/1/2014
St Petersburg	FL	St Petersburg-Clearwater International	PIE	N	$3.00	$4,051,039	1y6m	5/1/2005	11/1/2006
St Petersburg	FL	St Petersburg-Clearwater International	PIE	N	$4.50	**	2y3m	11/1/2006	2/1/2009
St Petersburg	FL	St Petersburg-Clearwater International	PIE	N	$4.50	$2,668,450	2y4m	2/1/2009	6/1/2011
Tallahassee	FL	Tallahassee Regional	TLH	S	$3.00	$11,219,936	9y8m	2/1/1993	10/1/2002
Tallahassee	FL	Tallahassee Regional	TLH	S	$4.50	$36,852,800	13y3m	10/1/2002	1/1/2016
Tampa	FL	Tampa International	TPA	L	$3.00	$170,777,120	8y8m	10/1/1993	6/1/2002
Tampa	FL	Tampa International	TPA	L	$4.50	$574,718,374	13y9m	6/1/2002	3/1/2016
Valparaiso	FL	Eglin AFB	VPS		$3.00	$34,407,710	1y5m	1/1/2001	6/1/2002
Valparaiso	FL	Eglin AFB	VPS		$4.50	**	16y2m	6/1/2002	8/1/2018
Valparaiso	FL	Eglin AFB	VPS		$4.50	$5,514,411	2y8m	8/1/2018	4/1/2021
West Palm Beach	FL	Palm Beach International	PBI	M	$3.00	$122,491,222	14y3m	4/1/1994	7/1/2008
West Palm Beach	FL	Palm Beach International	PBI	M	$4.50	$22,283,317	2y3m	7/1/2008	10/1/2010
Albany	GA	Southwest Georgia Regional	ABY	N	$3.00	$348,383	2y9m	9/1/1995	6/1/1998
Albany	GA	Southwest Georgia Regional	ABY	N	$3.00	$539,645	3y8m	6/1/1999	2/1/2003
Albany	GA	Southwest Georgia Regional	ABY	N	$4.50	**	6m	2/1/2003	8/1/2003
Albany	GA	Southwest Georgia Regional	ABY	N	$4.50	$457,111	4y6m	8/1/2003	2/1/2008
Albany	GA	Southwest Georgia Regional	ABY	N	$4.50	$341,518	2y1m	7/1/2008	8/1/2010
Athens	GA	Athens/Ben Epps	AHN	CS	$3.00	$165,615	4y5m	8/1/1997	1/1/2002
Atlanta	GA	Hartsfield-Jackson Atlanta Internatiional	ATL	L	$3.00	$1,463,359,982	3y11m	5/1/1997	4/1/2001
Atlanta	GA	Hartsfield-Jackson Atlanta Internatiional	ATL	L	$4.50	**	7y6m	4/1/2001	10/1/2008
Atlanta	GA	Hartsfield-Jackson Atlanta Internatiional	ATL	L	$4.50	$1,920,004,074	11y8m	10/1/2008	6/1/2020
Augusta	GA	Augusta Regional @ Bush Field	AGS	N	$3.00	$31,482,000	1y10m	9/1/1999	7/1/2001
Augusta	GA	Augusta Regional @ Bush Field	AGS	N	$4.50	**	29y	7/1/2001	7/1/2030
Augusta	GA	Augusta Regional @ Bush Field	AGS	N	$4.50	$2,007,000	2y1m	7/1/2030	8/1/2032
Brunswick	GA	Brunswick Golden Isles	BQK	N	$3.00	$813,170	2y6m	5/1/2001	11/1/2003
Brunswick	GA	Brunswick Golden Isles	BQK	N	$4.50	**	5y6m	11/1/2003	5/1/2009
Brunswick	GA	Brunswick Golden Isles	BQK	N	$4.50	$860,268	7y11m	5/1/2009	4/1/2017
Columbus	GA	Columbus Metropolitan	CSG	N	$3.00	$530,103	1y9m	12/1/1993	9/1/1995
Columbus	GA	Columbus Metropolitan	CSG	N	$3.00	$1,251,387	2y10m	8/1/2000	6/1/2003
Columbus	GA	Columbus Metropolitan	CSG	N	$4.50	**	3y5m	6/1/2003	11/1/2006
Macon	GA	Middle Georgia Regional	MCN	N	$4.50	$1,052,392	9y2m	3/1/2002	5/1/2011
Savannah	GA	Savannah/ Hilton Head International	SAV	S	$3.00	$49,908,639	8y9m	7/1/1992	4/1/2001
Savannah	GA	Savannah/ Hilton Head International	SAV	S	$4.50	**	8y10m	4/1/2001	2/1/2010
Savannah	GA	Savannah/ Hilton Head International	SAV	S	$3.00	$977,956	3m	2/1/2010	5/1/2010
Savannah	GA	Savannah/ Hilton Head International	SAV	S	$4.50	$13,969,343	3y6m	5/1/2010	11/1/2013
Valdosta	GA	Valdosta Regional	VLD	N	$3.00	$369,077	6y7m	3/1/1993	10/1/1999

Valdosta	GA	Valdosta Regional	VLD	N	$3.00	$230,300	1y2m	4/1/2000	6/1/2001
Valdosta	GA	Valdosta Regional	VLD	N	$4.50	**	3m	6/1/2001	9/1/2001
Valdosta	GA	Valdosta Regional	VLD	N	$4.50	$438,675	3y	9/1/2001	9/1/2004
Valdosta	GA	Valdosta Regional	VLD	N	$3.00	$67,858	3m	2/1/2006	5/1/2006
Valdosta	GA	Valdosta Regional	VLD	N	$3.00	$12,140	2m	11/1/2006	1/1/2007
Valdosta	GA	Valdosta Regional	VLD	N	$3.00	$30,300	4m	8/1/2009	12/1/2009
Agana	GU	Guam International	GUM	S	$3.00	$258,376,758	9y9m	2/1/1993	11/1/2002
Agana	GU	Guam International	GUM	S	$4.50	**	22y4m	11/1/2002	3/1/2025
Hilo	HI	Hilo International	ITO	S	$3.00	$548,196	1y7m	2/1/2007	11/1/2008
Hilo	HI	Hilo International	ITO	S	$4.50	**	1y2m	11/1/2008	1/1/2010
Honolulu	HI	Honolulu International	HNL	L	$3.00	$87,641,419	4y1m	10/1/2004	11/1/2008
Honolulu	HI	Honolulu International	HNL	L	$4.50	**	1y2m	11/1/2008	1/1/2010
Kahului	HI	Kahului	OGG	M	$3.00	$21,984,882	4y1m	10/1/2004	11/1/2008
Kahului	HI	Kahului	OGG	M	$4.50	**	1y2m	11/1/2008	1/1/2010
Kailua/Kona	HI	Kona International @ Keohole	KOA	S	$3.00	$5,777,963	4y1m	10/1/2004	11/1/2008
Kailua/Kona	HI	Kona International @ Keohole	KOA	S	$4.50	**	1y2m	11/1/2008	1/1/2010
Lihue	HI	Lihue	LIH	S	$3.00	$2,818,337	4y1m	10/1/2004	11/1/2008
Lihue	HI	Lihue	LIH	S	$4.50	**	1y2m	11/1/2008	1/1/2010
Boise	ID	Boise Air Terminal/ Gowen Field	BOI	S	$3.00	$20,191,058	7y	8/1/1994	8/1/2001
Boise	ID	Boise Air Terminal/ Gowen Field	BOI	S	$4.50	$102,262,147	18y	8/1/2001	8/1/2019
Hailey	ID	Friedman Memorial	SUN	N	$3.00	$188,000	1y1m	9/1/1993	10/1/1994
Hailey	ID	Friedman Memorial	SUN	N	$3.00	$1,721,835	10y3m	3/1/1995	6/1/2005
Hailey	ID	Friedman Memorial	SUN	N	$4.50	$1,435,356	4y6m	6/1/2005	12/1/2009
Idaho Falls	ID	Idaho Falls Regional	IDA	N	$3.00	$1,473,899	5y	1/1/1993	1/1/1998
Idaho Falls	ID	Idaho Falls Regional	IDA	N	$3.00	$836,239	2y8m	2/1/1998	10/1/2000
Idaho Falls	ID	Idaho Falls Regional	IDA	N	$3.00	$8,950,000	6m	10/1/2000	4/1/2001
Idaho Falls	ID	Idaho Falls Regional	IDA	N	$4.50	**	19y3m	4/1/2001	7/1/2020
Lewiston	ID	Lewiston-Nez Perce County	LWS	N	$3.00	$2,509,907	7y	5/1/1994	5/1/2001
Lewiston	ID	Lewiston-Nez Perce County	LWS	N	$4.50	**	5y5m	5/1/2001	10/1/2006
Lewiston	ID	Lewiston-Nez Perce County	LWS	N	$4.50	$1,171,746	9y9m	10/1/2006	7/1/2016
Pocatello	ID	Pocatello Regional	PIH	N	$3.00	$814,719	6y8m	9/1/1994	5/1/2001
Pocatello	ID	Pocatello Regional	PIH	N	$4.50	**	5m	5/1/2001	10/1/2001
Pocatello	ID	Pocatello Regional	PIH	N	$4.50	$1,249,580	9y8m	10/1/2001	6/1/2011
Twin Falls	ID	Joslin Field - Magic Valley Regional	TWF	N	$3.00	$1,628,107	8y7m	11/1/1992	6/1/2001
Twin Falls	ID	Joslin Field - Magic Valley Regional	TWF	N	$4.50	**	6y	6/1/2001	6/1/2007
Twin Falls	ID	Joslin Field - Magic Valley Regional	TWF	N	$4.50	$560,416	4y3m	7/1/2007	10/1/2011
Belleville	IL	Scott AFB/Midamerica	BLV	N	$3.00	$7,000,000	41y4m	11/1/2005	3/1/2047
Bloomington	IL	Central Illinois Regional Airport at Bloomington-Normal	BMI	N	$3.00	$28,084,564	6y5m	11/1/1994	4/1/2001
Bloomington	IL	Central Illinois Regional Airport at Bloomington-Normal	BMI	N	$4.50	**	16y6m	4/1/2001	10/1/2017
Bloomington	IL	Central Illinois Regional Airport at Bloomington-Normal	BMI	N	$4.50	$1,161,019	7m	10/1/2017	6/1/2018
Champaign/Urbana	IL	University of Illinois-Willard	CMI	N	$3.00	$2,745,800	8y2m	12/1/1995	2/1/2004
Champaign/Urbana	IL	University of Illinois-Willard	CMI	N	$4.50	$2,135,160	5y5m	10/1/2005	3/1/2011
Chicago	IL	Chicago Midway International	MDW	L	$3.00	$700,492,108	13y4m	9/1/1993	1/1/2007

Chicago	IL	Chicago Midway International	MDW	L	$4.50	**	5y11m	1/1/2007	11/1/2012
Chicago	IL	Chicago Midway International	MDW	L	$4.50	$1,538,247,302	41y	11/1/2012	11/1/2053
Chicago	IL	Chicago O'Hare International	ORD	L	$3.00	$1,701,450,995	7y7m	9/1/1993	4/1/2001
Chicago	IL	Chicago O'Hare Intenational	ORD	L	$4.50	**	4y10m	4/1/2001	2/1/2006
Chicago	IL	Chicago O'Hare International	ORD	L	$4.50	$2,952,034,484	20y3m	2/1/2006	5/1/2026
Decatur	IL	Decatur	DEC	CS	$4.50	$732,628	12y9m	6/1/2006	3/1/2019
Marion	IL	Williamson County Regional	MWA	CS	$4.50	$509,499	10y6m	9/1/2005	3/1/2016
Moline	IL	Quad City International	MLI	S	$3.00	$29,523,476	7y11m	12/1/1994	1/1/2002
Moline	IL	Quad City International	MLI	S	$4.50	**	14y6m	1/1/2002	7/1/2016
Moline	IL	Quad City International	MLI	S	$4.50	$1,520,320	1y	7/1/2016	7/1/2017
Peoria	IL	Greater Peoria Regional	PIA	N	$3.00	$8,145,036	6y7m	12/1/1994	7/1/2001
Peoria	IL	Greater Peoria Regional	PIA	N	$4.50	**	5y7m	7/1/2001	2/1/2007
Peoria	IL	Greater Peoria Regional	PIA	N	$4.50	$1,476,770	1y6m	2/1/2007	8/1/2008
Peoria	IL	Greater Peoria Regional	PIA	N	$4.50	$7,500,000	6y3m	11/1/2008	2/1/2015
Quincy	IL	Quincy Regional-Baldwin Field	UIN	CS	$3.00	$115,517	2y9m	10/1/1994	7/1/1997
Quincy	IL	Quincy Regional-Baldwin Field	UIN	CS	$3.00	$298,153	7y7m	11/1/1997	6/1/2005
Quincy	IL	Quincy Regional-Baldwin Field	UIN	CS	$3.00	*	2y2m	11/1/2005	1/1/2008
Quincy	IL	Quincy Regional-Baldwin Field	UIN	CS	$4.50	$635,573	11y2m	1/1/2008	3/1/2019
Rockford	IL	Chicago/ Rockford International	RFD	N	$3.00	$385,681	4y	10/1/1992	10/1/1996
Rockford	IL	Chicago/ Rockford International	RFD	N	$3.00	$7,066,659	10y1m	5/1/1997	6/1/2007
Rockford	IL	Chicago/ Rockford International	RFD	N	$4.50	**	6y11m	6/1/2007	5/1/2014
Springfield	IL	Abraham Lincoln Capital	SPI	N	$3.00	$4,901,693	9y11m	6/1/1992	5/1/2002
Springfield	IL	Abraham Lincoln Capital	SPI	N	$4.50	**	5y5m	5/1/2002	10/1/2005
Springfield	IL	Abraham Lincoln Capital	SPI	N	$4.50	$1,173,000	6y2m	10/1/2005	12/1/2011
Evansville	IN	Evansville Regional	EVV	N	$4.50	$1,270,789	1y3m	8/1/2007	11/1/2008
Evansville	IN	Evansville Regional	EVV	N	$4.50	$3,983,706	4y2m	12/1/2008	2/1/2013
Fort Wayne	IN	Fort Wayne International	FWA	N	$3.00	$26,563,457	12y5m	7/1/1993	12/1/2005
Fort Wayne	IN	Fort Wayne International	FWA	N	$4.50	**	10y10m	12/1/2005	10/1/2016
Fort Wayne	IN	Fort Wayne International	FWA	N	$4.50	$2,045,000	1y5m	10/1/2016	3/1/2018
Indianapolis	IN	Indianapolis International	IND	M	$3.00	$80,978,605	7y7m	9/1/1993	4/1/2001
Indianapolis	IN	Indianapolis International	IND	M	$4.50	**	6m	4/1/2001	10/1/2001
Indianapolis	IN	Indianapolis International	IND	M	$4.50	$444,022,707	20y10m	10/1/2001	9/1/2022
Indianapolis	IN	Indianapolis International	IND	M	$3.00	$59,000	1m	9/1/2022	10/1/2022
South Bend	IN	South Bend Regional	SBN	S	$3.00	$34,172,802	26y11m	11/1/1994	10/1/2021
Burlington	IA	Southeast Iowa Regional	BRL		$3.00	$521,304	4y2m	7/1/1997	9/1/2001
Burlington	IA	Southeast Iowa Regional	BRL		$4.50	**	9y5m	9/1/2001	2/1/2011
Cedar Rapids	IA	The Eastern Iowa	CID	S	$3.00	$11,716,385	7y5m	1/1/1995	6/1/2002
Cedar Rapids	IA	The Eastern Iowa	CID	S	$4.50	**	1y9m	6/1/2002	3/1/2004
Cedar Rapids	IA	The Eastern Iowa	CID	S	$4.50	$11,459,311	5y6m	5/1/2004	11/1/2009
Des Moines	IA	Des Moines International	DSM	S	$3.00	$17,933,852	7y5m	3/1/1994	8/1/2001
Des Moines	IA	Des Moines International	DSM	S	$4.50	**	9m	8/1/2001	5/1/2002

Des Moines	IA	Des Moines International	DSM	S	$4.50	$47,643,654	15y8m	5/1/2002	1/1/2018
Dubuque	IA	Dubuque Regional	DBQ	N	$3.00	$1,144,527	8y4m	1/1/1993	5/1/2001
Dubuque	IA	Dubuque Regional	DBQ	N	$4.50	$2,144,553	11y8m	5/1/2001	1/1/2013
Fort Dodge	IA	Fort Dodge Regional	FOD	CS	$3.00	$169,331	6y6m	3/1/1995	9/1/2001
Fort Dodge	IA	Fort Dodge Regional	FOD	CS	$4.50	$315,570	9y3m	1/1/2002	4/1/2011
Mason City	IA	Mason City Municipal	MCW	N	$3.00	$302,090	5y9m	2/1/1996	10/1/2001
Mason City	IA	Mason City Municipal	MCW	N	$4.50	**	1y6y	10/1/2001	4/1/2003
Mason City	IA	Mason City Municipal	MCW	N	$4.50	$379,500	6y	8/1/2003	8/1/2009
Sioux City	IA	Sioux Gateway/Col. Bud Day Field	SUX	N	$3.00	$204,465	1y	6/1/1993	6/1/1994
Sioux City	IA	Sioux Gateway/Col. Bud Day Field	SUX	N	$3.00	$2,505,560	7y1m	2/1/1995	3/1/2002
Sioux City	IA	Sioux Gateway/Col. Bud Day Field	SUX	N	$4.50	**	1y10m	3/1/2002	1/1/2004
Sioux City	IA	Sioux Gateway/Col. Bud Day Field	SUX	N	$4.50	$969,350	5y4m	11/1/2004	3/1/2010
Spencer	IA	Spencer Municipal	SPW		$3.00	$77,638	10y6m	9/1/1995	3/1/2006
Waterloo	IA	Waterloo Regional	ALO	N	$3.00	$628,088	4y	6/1/1994	6/1/1998
Waterloo	IA	Waterloo Regional	ALO	N	$3.00	$784,036	1y10m	9/1/1999	7/1/2001
Waterloo	IA	Waterloo Regional	ALO	N	$4.50	**	1y10m	7/1/2001	5/1/2003
Waterloo	IA	Waterloo Regional	ALO	N	$4.50	$1,169,836	8y6m	5/1/2003	11/1/2011
Manhattan	KS	Manhattan Regional	MHK	N	$3.00	$401,978	3y5m	10/1/1998	3/1/2002
Manhattan	KS	Manhattan Regional	MHK	N	$4.50	**	6y4m	3/1/2002	7/1/2008
Manhattan	KS	Manhattan Regional	MHK	N	$4.50	$601,007	9y11m	7/1/2008	6/1/2018
Topeka	KS	Forbes Field	FOE	N	$4.50	$823,720	15y7m	8/1/2007	3/1/2023
Wichita	KS	Wichita Mid-Continent	ICT	S	$3.00	$25,595,806	10y6m	12/1/1994	5/1/2005
Wichita	KS	Wichita Mid-Continent	ICT	S	$4.50	**	2y1m	5/1/2005	6/1/2007
Wichita	KS	Wichita Mid-Continent	ICT	S	$4.50	$7,548,050	2y2m	7/1/2007	9/1/2009
Covington	KY	Cincinnati/Northern Kentucky International	CVG	L	$3.00	$158,964,555	6y2m	6/1/1994	8/1/2000
Covington	KY	Cincinnati/Northern Kentucky International	CVG	L	$3.00	$74,129,829	2y1m	7/1/2001	8/1/2003
Covington	KY	Cincinnati/Northern Kentucky International	CVG	L	$4.50	$213,098,000	5y9m	8/1/2003	5/1/2009
Covington	KY	Cincinnati/Northern Kentucky International	CVG	L	$3.00	$93,860,000	3y2m	5/1/2009	7/1/2012
Lexington	KY	Blue Grass	LEX	S	$3.00	$12,009,818	7y7m	11/1/1993	6/1/2001
Lexington	KY	Blue Grass	LEX	S	$4.50	**	2y	6/1/2001	6/1/2003
Lexington	KY	Blue Grass	LEX	S	$3.00	$500,557	4m	8/1/2003	12/1/2003
Lexington	KY	Blue Grass	LEX	S	$4.50	$50,404,396	18y8m	12/1/2003	8/1/2022
Louisville	KY	Louisville International - Standiford Field	SDF	M	$3.00	$90,600,000	8y10m	5/1/1997	3/1/2006
Louisville	KY	Louisville International - Standiford Field	SDF	M	$4.50	**	7m	3/1/2006	10/1/2006
Louisville	KY	Louisville International - Standiford Field	SDF	M	$3.00	**	1y11m	10/1/2006	9/1/2008
Louisville	KY	Louisville International - Standiford Field	SDF	M	$4.50	**	1m	9/1/2008	10/1/2008
Louisville	KY	Louisville International - Standiford Field	SDF	M	$3.00	**	6y1m	10/1/2008	11/1/2014
Louisville	KY	Louisville International - Standiford Field	SDF	M	$3.00	$15,678,940	3y5m	11/1/2014	4/1/2018
Louisville	KY	Louisville International - Standiford Field	SDF	M	$4.50	$1,267,315	2m	4/1/2018	6/1/2018
Paducah	KY	Barkley Regional	PAH	N	$3.00	$1,696,178	20y	3/1/1994	3/1/2014
Alexandria	LA	Alexandria International	AEX	N	$3.00	$10,284,927	2y8m	5/1/1999	1/1/2002
Alexandria	LA	Alexandria International	AEX	N	$4.50	**	20y11m	1/1/2002	12/1/2022
Baton Rouge	LA	Baton Rouge Metropolitan, Ryan Field	BTR	S	$3.00	$37,469,799	12y10m	12/1/1992	10/1/2005

Baton Rouge	LA	Baton Rouge Metropolitan, Ryan Field	BTR	S	$4.50	**	13y4m	10/1/2005	2/1/2018
Baton Rouge	LA	Baton Rouge Metropolitan, Ryan Field	BTR	S	$4.50	$43,889,437	12y5m	2/1/2018	7/1/2031
Lafayette	LA	Lafayette Regional	LFT	N	$3.00	$1,083,024	3y	9/1/1995	9/1/1998
Lafayette	LA	Lafayette Regional	LFT	N	$3.00	$2,273,692	1y	4/1/2001	4/1/2002
Lafayette	LA	Lafayette Regional	LFT	N	$4.50	**	2y8m	4/1/2002	1/1/2005
Lafayette	LA	Lafayette Regional	LFT	N	$4.50	$3,433,629	2y11m	5/1/2005	4/1/2008
Lafayette	LA	Lafayette Regional	LFT	N	$4.50	$3,950,000	3y9m	8/1/2008	5/1/2012
Lake Charles	LA	Lake Charles Regional	LCH	N	$3.00	$1,377,234	4y2m	3/1/2001	5/1/2005
Lake Charles	LA	Lake Charles Regional	LCH	N	$4.50	**	4y5m	5/1/2005	10/1/2009
Lake Charles	LA	Lake Charles Regional	LCH	N	$4.50	$420,000	2y2m	10/1/2009	12/1/2011
Monroe	LA	Monroe Regional	MLU	N	$4.50	$1,854,672	4y5m	4/1/2003	9/1/2007
Monroe	LA	Monroe Regional	MLU	N	$4.50	$16,400,000	25y7m	11/1/2008	6/1/2036
New Orleans	LA	Louis Armstrong New Orleans International	MSY	M	$3.00	$133,503,363	8y10m	6/1/1993	4/1/2002
New Orleans	LA	Louis Armstrong New Orleans International	MSY	M	$4.50	**	1y4m	4/1/2002	8/1/2003
New Orleans	LA	Louis Armstrong New Orleans International	MSY	M	$4.50	$347,542,753	16y5m	8/1/2003	1/1/2020
Shreveport	LA	Shreveport Regional	SHV	N	$3.00	$29,841,353	8y9m	2/1/1994	11/1/2002
Shreveport	LA	Shreveport Regional	SHV	N	$4.50	**	11y10m	11/1/2002	9/1/2014
Bangor	ME	Bangor International	BGR	N	$3.00	$8,961,006	15y3m	6/1/1995	9/1/2010
Portland	ME	Portland International Jetport	PWM	S	$3.00	$35,102,100	15y	2/1/1994	2/1/2009
Portland	ME	Portland International Jetport	PWM	S	$4.50	**	1y9m	2/1/2009	11/1/2010
Presque Isle	ME	Northern Maine Regional Airport at Presque Isle	PQI	N	$4.50	$245,853	4y9m	9/1/2004	6/1/2009
Baltimore	MD	Baltimore/Washington International Thurgood Marshal	BWI	L	$3.00	$241,627,775	9y8m	10/1/1992	6/1/2002
Baltimore	MD	Baltimore/Washington International Thurgood Marshal	BWI	L	$4.50	**	5m	6/1/2002	11/1/2002
Baltimore	MD	Baltimore/Washington International Thurgood Marshal	BWI	L	$4.50	$618,019,115	13y2m	11/1/2002	1/1/2016
Cumberland	MD	Greater Cumberland Reg	CBE		$3.00	$150,000	5y	7/1/1994	7/1/1999
Cumberland	MD	Greater Cumberland Reg	CBE		$3.00	*	6y8m	10/1/1999	6/1/2006
Hagerstown	MD	Hagerstown Regional-Richard A Henson Field	HGR	CS	$3.00	$308,817	2y7m	8/1/1999	3/1/2002
Hagerstown	MD	Hagerstown Regional-Richard A Henson Field	HGR	CS	$4.50	**	1y10m	3/1/2002	1/1/2004
Hagerstown	MD	Hagerstown Regional-Richard A Henson Field	HGR	CS	$4.50	$108,124	3y7m	1/1/2004	8/1/2007
Salisbury	MD	Salisbury-Ocean City Wicomico Regional	SBY	N	$3.00	$2,352,042	6y1m	2/1/2002	3/1/2008
Salisbury	MD	Salisbury-Ocean City Wicomico Regional	SBY	N	$4.50	**	4y3m	3/1/2008	6/1/2012
Boston	MA	General Edward Lawrence Logan International	BOS	L	$3.00	$702,015,217	11y11m	11/1/1993	10/1/2005
Boston	MA	General Edward Lawrence Logan International	BOS	L	$4.50	**	5y4m	10/1/2005	2/1/2011
Boston	MA	General Edward Lawrence Logan International	BOS	L	$4.50	$293,018,000	5y	2/1/2011	2/1/2016
Worcester	MA	Worcester Regional	ORH		$3.00	$614,336	5y	10/1/1992	10/1/1997
Worcester	MA	Worcester Regional	ORH		$3.00	$1,021,417	10y3m	9/1/1999	12/1/2009

Alpena	MI	Alpena County Regional	APN	CS	$3.00	$268,480	4y4m	8/1/2001	12/1/2005
Alpena	MI	Alpena County Regional	APN	CS	$4.50	**	2y8m	12/1/2005	8/1/2008
Alpena	MI	Alpena County Regional	APN	CS	$4.50	$193,959	4y5m	8/1/2008	1/1/2013
Detroit	MI	Detroit City	DET		$3.00	$1,250,000	4y2m	1/1/2000	3/1/2004
Detroit	MI	Detroit Metropolitan Wayne County	DTW	L	$3.00	$2,198,215,360	8y9m	1/1/1993	10/1/2001
Detroit	MI	Detroit Metropolitan Wayne County	DTW	L	$4.50	**	24y7m	10/1/2001	5/1/2026
Detroit	MI	Detroit Metropolitan Wayne County	DTW	L	$4.50	$966,117,476	8y3m	5/1/2026	8/1/2034
Escanaba	MI	Delta County	ESC	CS	$3.00	$149,319	5y2m	2/1/1993	11/1/1997
Escanaba	MI	Delta County	ESC	CS	$3.00	$197,877	1y11m	8/1/1998	7/1/2000
Escanaba	MI	Delta County	ESC	CS	$3.00	$114,900	2y5m	10/1/2001	3/1/2004
Escanaba	MI	Delta County	ESC	CS	$4.50	$40,000	1y10m	3/1/2004	1/1/2006
Escanaba	MI	Delta County	ESC	CS	$4.50	$322,158	6y9m	4/1/2006	1/1/2013
Flint	MI	Bishop International	FNT	S	$3.00	$31,865,870	8y1m	9/1/1993	10/1/2001
Flint	MI	Bishop International	FNT	S	$4.50	**	16y3m	10/1/2001	1/1/2018
Grand Rapids	MI	Gerald R. Ford International	GRR	S	$3.00	$94,359,802	12y11m	12/1/1992	11/1/2005
Grand Rapids	MI	Gerald R. Ford International	GRR	S	$4.50	**	10y11m	11/1/2005	10/1/2016
Grand Rapids	MI	Gerald R. Ford International	GRR	S	$4.50	$7,654,985	2y4m	10/1/2016	2/1/2019
Hancock	MI	Houghton County Memorial	CMX	N	$3.00	$164,920	2y8m	7/1/1993	3/1/1996
Hancock	MI	Houghton County Memorial	CMX	N	$3.00	$149,326	3y	7/1/1996	7/1/1999
Hancock	MI	Houghton County Memorial	CMX	N	$3.00	$384,873	5y9m	10/1/1999	7/1/2005
Hancock	MI	Houghton County Memorial	CMX	N	$4.50	**	1y4m	7/1/2005	11/1/2006
Hancock	MI	Houghton County Memorial	CMX	N	$4.50	$602,538	6y3m	11/1/2006	2/1/2013
Iron Mountain Kingsford	MI	Ford	IMT	CS	$3.00	$204,029	8y9m	9/1/1995	6/1/2004
Ironwood	MI	Gogebic-Iron County	IWD	CS	$3.00	$90,531	13y2m	8/1/1993	10/1/2006
Ironwood	MI	Gogebic-Iron County	IWD	CS	$4.50	$128,549	18y8m	6/1/2007	2/1/2026
Kalamazoo	MI	Kalamazoo/Battle Creek International	AZO	N	$3.00	$1,089,716	3y2m	4/1/1997	6/1/2000
Kalamazoo	MI	Kalamazoo/Battle Creek International	AZO	N	$3.00	$5,312,429	4y	1/1/2001	1/1/2005
Kalamazoo	MI	Kalamazoo/Battle Creek International	AZO	N	$4.50	**	1y7m	1/1/2005	8/1/2006
Kalamazoo	MI	Kalamazoo/Battle Creek International	AZO	N	$4.50	$1,500,000	1y6m	10/1/2006	4/1/2008
Kalamazoo	MI	Kalamazoo/Battle Creek International	AZO	N	$4.50	$14,821,076	16y	9/1/2008	9/1/2024
Lansing	MI	Capital City	LAN	N	$3.00	$6,422,640	8y9m	10/1/1993	7/1/2002
Lansing	MI	Capital City	LAN	N	$4.50	**	6y	7/1/2002	7/1/2008
Lansing	MI	Capital City	LAN	N	$4.50	$32,751,609	13y7m	7/1/2008	2/1/2022
Manistee	MI	Manistee County-Blacker	MBL	CS	$4.50	$388,988	32y5m	6/1/2008	11/1/2040
Marquette	MI	Marquette County	MQT	N	$3.00	$62,225	4y	12/1/1992	12/1/1996
Marquette	MI	Sawyer International	SAW/MQT	N	$3.00	$1,077,540	4y3m	4/1/1998	7/1/2002
Marquette	MI	Sawyer International	SAW/MQT	N	$4.50	**	6m	7/1/2002	1/1/2003
Marquette	MI	Sawyer International	SAW/MQT	N	$4.50	$773,078	3y8m	1/1/2003	9/1/2006
Marquette	MI	Sawyer International	SAW/MQT	N	$4.50	$150,711	1y7m	10/1/2006	5/1/2008
Marquette	MI	Sawyer International	SAW/MQT	N	$4.50	$852,250	3y	8/1/2008	8/1/2011
Muskegon	MI	Muskegon County	MKG	N	$3.00	$5,013,088	10y1m	5/1/1994	5/1/2004
Muskegon	MI	Muskegon County	MKG	N	$4.50	**	16y6m	5/1/2004	11/1/2020
Pellston	MI	Pellston Regional Airport of Emmet County	PLN	N	$3.00	$159,752	4y6m	3/1/1993	9/1/1997

Pellston	MI	Pellston Regional Airport of Emmet County	PLN	N	$3.00	$916,433	13y7m	12/1/1997	7/1/2011
Pellston	MI	Pellston Regional Airport of Emmet County	PLN	N	$4.50	$280,750	2y	7/1/2011	7/1/2013
Saginaw	MI	MBS International	MBS	N	$3.00	$7,552,127	10y5m	2/1/1997	7/1/2007
Saginaw	MI	MBS International	MBS	N	$4.50	**	9m	7/1/2007	4/1/2008
Saginaw	MI	MBS International	MBS	N	$4.50	$2,783,693	2y10m	4/1/2008	2/1/2011
Sault Ste. Marie	MI	Chippewa County International	CIU	N	$4.50	$1,087,463	17y8m	11/1/2005	7/1/2023
Traverse City	MI	Cherry Capital	TVC	N	$3.00	$4,057,060	5y	1/1/1997	1/1/2002
Traverse City	MI	Cherry Capital	TVC	N	$4.50	**	1y9m	1/1/2002	10/1/2003
Traverse City	MI	Cherry Capital	TVC	N	$4.50	$5,619,279	7y2m	10/1/2003	12/1/2010
Bemidji	MN	Bemidji Regional	BJI	N	$3.00	$362,099	5y3m	11/1/1996	2/1/2002
Bemidji	MN	Bemidji Regional	BJI	N	$4.50	$416,452	3y6m	2/1/2002	8/1/2005
Bemidji	MN	Bemidji Regional	BJI	N	$4.50	$337,711	4y4m	6/1/2006	10/1/2010
Brainerd	MN	Brainerd Lakes Regional	BRD	N	$3.00	$313,455	7y11m	8/1/1993	7/1/2001
Brainerd	MN	Brainerd Lakes Regional	BRD	N	$4.50	$1,845,907	22y3m	7/1/2001	7/1/2024
Duluth	MN	Duluth International	DLH	N	$3.00	$2,341,795	7y6m	10/1/1994	4/1/2002
Duluth	MN	Duluth International	DLH	N	$4.50	$1,278,964	2y7m	4/1/2002	11/1/2004
Duluth	MN	Duluth International	DLH	N	$4.50	$3,200,387	6y	4/1/2005	4/1/2011
Grand Rapids	MN	Grand Rapids/Itasca County	GPZ		$3.00	$151,263	3y10m	12/1/1997	10/1/2001
Grand Rapids	MN	Grand Rapids/Itasca County	GPZ		$4.50	**	5y3m	10/1/2001	1/1/2007
Hibbing	MN	Chisholm-Hibbing	HIB	CS	$3.00	$338,299	7y1m	6/1/1996	7/1/2003
Hibbing	MN	Chisholm-Hibbing	HIB	CS	$4.50	**	3y10m	7/1/2003	5/1/2007
Hibbing	MN	Chisholm-Hibbing	HIB	CS	$4.50	$461,737	10y6m	5/1/2007	11/1/2017
International Falls	MN	Falls International	INL	N	$3.00	$597,058	7y6m	12/1/1994	6/1/2002
International Falls	MN	Falls International	INL	N	$4.50	**	3y	6/1/2002	6/1/2005
International Falls	MN	Falls International	INL	N	$4.50	$477,226	5y8m	11/1/2005	7/1/2011
Minneapolis	MN	Minneapolis-St Paul International/Wold-Chamberlain	MSP	L	$3.00	$430,142,570	8y10m	6/1/1992	4/1/2001
Minneapolis	MN	Minneapolis-St Paul International/Wold-Chamberlain	MSP	L	$4.50	**	1y10m	4/1/2001	2/1/2003
Minneapolis	MN	Minneapolis-St Paul International/Wold-Chamberlain	MSP	L	$4.50	$1,488,622,797	17y6m	2/1/2003	8/1/2020
Rochester	MN	Rochester International	RST	N	$3.00	$5,889,069	5y10m	5/1/1996	3/1/2002
Rochester	MN	Rochester International	RST	N	$4.50	**	6y5m	3/1/2002	8/1/2008
Rochester	MN	Rochester International	RST	N	$4.50	$1,555,114	2y5m	8/1/2008	1/1/2011
St. Cloud	MN	St. Cloud Regional	STC	N	$3.00	$1,147,578	2y5m	2/1/2000	7/1/2002
St. Cloud	MN	St. Cloud Regional	STC	N	$4.50	**	11y6m	7/1/2002	1/1/2014
Thief River Falls	MN	Thief River Falls Regional	TVF	CS	$4.50	$636,828	20y	6/1/2003	6/1/2023
Rota Island	MP	Rota International	GRO/ROP	N	$4.50	$1,797,042	11y8m	1/1/2005	8/1/2016
Saipan Island	MP	Francisco C. Ada/Saipan International	GSN/SPN	S	$4.50	$29,920,680	11y8m	1/1/2005	8/1/2016
Tinian Island	MP	Tinian International	TNI/TIQ	N	$4.50	$1,724,826	11y8m	1/1/2005	8/1/2016
Columbus	MS	Golden Triangle Regional	GTR	N	$3.00	$1,526,314	8y8m	8/1/1992	4/1/2001
Columbus	MS	Golden Triangle Regional	GTR	N	$4.50	**	2y9m	4/1/2001	1/1/2004
Columbus	MS	Golden Triangle Regional	GTR	N	$4.50	$1,792,656	12y2m	1/1/2004	3/1/2016
Greenville	MS	Mid Delta Regional	GLH	CS	$3.00	$148,873	4y4m	10/1/1998	2/1/2003
Greenville	MS	Mid Delta Regional	GLH	CS	$3.00	*	4m	4/1/2003	8/1/2003

Greenville	MS	Mid Delta Regional	GLH	CS	$3.00	$88,495	1y8m	8/1/2003	4/1/2005
Greenville	MS	Mid Delta Regional	GLH	CS	$4.50	**	8m	4/1/2005	12/1/2005
Greenville	MS	Mid Delta Regional	GLH	CS	$4.50	$175,041	5y4m	12/1/2005	8/1/2011
Gulfport	MS	Gulfport-Biloxi International	GPT	S	$3.00	$8,247,199	9y1m	7/1/1992	8/1/2001
Gulfport	MS	Gulfport-Biloxi International	GPT	S	$3.00	*	6m	12/1/2001	6/1/2002
Gulfport	MS	Gulfport-Biloxi International	GPT	S	$3.00	$1,031,474	9m	6/1/2002	5/1/2003
Gulfport	MS	Gulfport-Biloxi International	GPT	S	$4.50	$57,145,388	24y8m	5/1/2003	1/1/2028
Hattiesburg	MS	Hattiesburg-Laurel Regional	PIB	N	$3.00	$237,929	8y11m	7/1/1992	6/1/2001
Hattiesburg	MS	Hattiesburg-Laurel Regional	PIB	N	$4.50	$897,769	11y11m	6/1/2001	5/1/2013
Jackson	MS	Jackson-Evers International	JAN	S	$3.00	$22,296,401	10y5m	5/1/1993	10/1/2003
Jackson	MS	Jackson-Evers International	JAN	S	$4.50	**	2y3m	10/1/2003	1/1/2006
Jackson	MS	Jackson-Evers International	JAN	S	$4.50	$29,712,969	9y2m	1/1/2006	3/1/2015
Meridian	MS	Key Field	MEI	N	$3.00	$293,059	3y9m	11/1/1992	8/1/1996
Meridian	MS	Key Field	MEI	N	$3.00	$481,882	4y9m	3/1/1997	12/1/2001
Meridian	MS	Key Field	MEI	N	$4.50	**	2y5m	12/1/2001	5/1/2004
Meridian	MS	Key Field	MEI	N	$4.50	$1,400,134	11y10m	10/1/2005	8/1/2017
Tupelo	MS	Tupelo Regional	TUP	N	$3.00	$457,216	8y5m	11/1/1994	4/1/2003
Tupelo	MS	Tupelo Regional	TUP	N	$4.50	**	8m	4/1/2003	1/1/2004
Tupelo	MS	Tupelo Regional	TUP	N	$4.50	$1,286,003	14y11m	1/1/2004	12/1/2018
Columbia	MO	Columbia Regional	COU	N	$4.50	$809,302	10y3m	11/1/2002	2/1/2013
Joplin	MO	Joplin Regional	JLN	N	$4.50	$889,664	7y2m	4/1/2003	6/1/2010
Kansas City	MO	Kansas City International	MCI	M	$3.00	$347,552,284	9y5m	3/1/1996	8/1/2005
Kansas City	MO	Kansas City International	MCI	M	$4.50	**	7y11m	8/1/2005	7/1/2013
Kansas City	MO	Kansas City International	MCI	M	$4.50	$30,646,859	1y	7/1/2013	7/1/2014
Springfield	MO	Springfield-Branson National	SGF	S	$3.00	$3,110,598	3y9m	11/1/1993	5/1/1997
Springfield	MO	Springfield-Branson National	SGF	S	$3.00	$6,370,614	2y10m	7/1/1998	5/1/2001
Springfield	MO	Springfield-Branson National	SGF	S	$4.50	**	2y7m	5/1/2001	1/1/2004
Springfield	MO	Springfield-Branson National	SGF	S	$4.50	$2,168,000	1y3m	5/1/2004	8/1/2005
Springfield	MO	Springfield-Branson National	SGF	S	$4.50	$900,000	6m	9/1/2005	3/1/2006
Springfield	MO	Springfield-Branson National	SGF	S	$4.50	$83,651,097	29y	1/1/2007	1/1/2036
St Louis	MO	Lambert-St Louis International	STL	M	$3.00	$325,379,031	9y	12/1/1992	12/1/2001
St Louis	MO	Lambert-St Louis International	STL	M	$4.50	**	12y1m	12/1/2001	5/1/2002
St Louis	MO	Lambert-St Louis International	STL	M	$4.50	$783,625,492	19y9m	5/1/2002	2/1/2022
Billings	MT	Billings Logan International	BIL	S	$3.00	$15,578,512	17y4m	4/1/1994	8/1/2011
Bozeman	MT	Gallatin Field	BZN	N	$3.00	$9,144,326	15y7m	8/1/1993	3/1/2009
Bozeman	MT	Gallatin Field	BZN	N	$4.50	$2,200,000	2y	3/1/2009	3/1/2011
Butte	MT	Bert Mooney	BTM	N	$3.00	$1,289,307	11y11m	7/1/1994	6/1/2006
Butte	MT	Bert Mooney	BTM	N	$3.00	$110,883	1y1m	7/1/2006	8/1/2007
Butte	MT	Bert Mooney	BTM	N	$3.00	$146,916	2y	11/1/2007	11/1/2009
Great Falls	MT	Great Falls International	GTF	N	$3.00	$3,059,263	9y8m	11/1/1992	7/1/2002
Great Falls	MT	Great Falls International	GTF	N	$4.50	$8,501,340	20y4m	7/1/2002	9/1/2018
Helena	MT	Helena Regional	HLN	N	$3.00	$1,949,098	9y4m	4/1/1993	8/1/2002
Helena	MT	Helena Regional	HLN	N	$4.50	**	1y2m	8/1/2002	10/1/2003
Helena	MT	Helena Regional	HLN	N	$4.50	$2,938,178	9y	10/1/2003	10/1/2012
Kalispell	MT	Glacier Park	GPI/FCA	N	$3.00	$10,997,914	11y5m	12/1/1993	4/1/2005

		International							
Kalispell	MT	Glacier Park International	GPI/FCA	N	$4.50	**	11y3m	4/1/2005	7/1/2016
Kalispell	MT	Glacier Park International	GPI/FCA	N	$4.50	$833,138	1y4m	7/1/2016	11/1/2017
Missoula	MT	Missoula International	MSO	N	$3.00	$5,875,780	8y7m	9/1/1992	4/1/2001
Missoula	MT	Missoula International	MSO	N	$4.50	**	1y11m	4/1/2001	3/1/2003
Missoula	MT	Missoula International	MSO	N	$4.50	$14,367,186	14y8m	3/1/2003	11/1/2017
Grand Island	NE	Central Nebraska Regional	GRI	CS	$3.00	$50,370	2y2m	2/1/1999	4/1/2001
Grand Island	NE	Central Nebraska Regional	GRI	CS	$4.50	$545,219	12y6m	5/1/2001	11/1/2013
Kearney	NE	Kearney Regional	EAR	N	$4.00	$0	1y10m	11/1/2005	9/1/2007
Kearney	NE	Kearney Regional	EAR	N	$4.50	$153,893	2y1m	9/1/2007	10/1/2009
Scottsbluff	NE	Western Nebraska Regional/ William B. Heilig Field	BFF	N	$3.00	$0	3y	3/1/2000	3/1/2003
Scottsbluff	NE	Western Nebraska Regional/ William B. Heilig Field	BFF	N	$4.50	$1,299,534	20y	7/1/2004	7/1/2024
Elko	NV	Elko Regional	EKO	N	$3.00	$6,790,017	5y2m	9/1/1998	11/1/2003
Elko	NV	Elko Regional	EKO	N	$4.50	**	17y3m	11/1/2003	2/1/2021
Las Vegas	NV	McCarran International	LAS	L	$3.00	$849,713,056	12y5m	6/1/1992	11/1/2004
Las Vegas	NV	McCarran International	LAS	L	$4.50	**	1y10m	11/1/2004	9/1/2006
Las Vegas	NV	McCarran International	LAS	L	$3.00	**	4m	9/1/2006	1/1/2007
Las Vegas	NV	McCarran International	LAS	L	$4.00	**	1y9m	1/1/2007	10/1/2008
Las Vegas	NV	McCarran International	LAS	L	$4.50	$1,858,167,530	18y2m	10/1/2008	12/1/2026
Reno	NV	Reno/Tahoe International	RNO	M	$3.00	$60,828,215	7y1m	1/1/1994	2/1/2001
Reno	NV	Reno/Tahoe International	RNO	M	$4.50	$6,764,380	10m	8/1/2001	6/1/2002
Reno	NV	Reno/Tahoe International	RNO	M	$3.00	$6,734,192	8m	6/1/2002	2/1/2003
Reno	NV	Reno/Tahoe International	RNO	M	$4.50	$15,626,067	1y8m	2/1/2003	10/1/2004
Reno	NV	Reno/Tahoe International	RNO	M	$3.00	**	2m	10/1/2004	12/1/2004
Reno	NV	Reno/Tahoe International	RNO	M	$3.00	$49,500,000	5m	12/1/2004	4/1/2005
Reno	NV	Reno/Tahoe International	RNO	M	$4.50	**	2y4m	4/1/2005	7/1/2007
Reno	NV	Reno/Tahoe International	RNO	M	$3.00	$3,400,000	5m	7/1/2007	12/1/2007
Reno	NV	Reno/Tahoe International	RNO	M	$4.50	$32,878,000	3y	12/1/2007	12/1/2010
Lebanon	NH	Lebanon Municipal	LEB	CS	$3.00	$530,630	7y	8/1/1995	8/1/2002
Lebanon	NH	Lebanon Municipal	LEB	CS	$4.50	$63,774	2y6m	11/1/2003	5/1/2006
Lebanon	NH	Lebanon Municipal	LEB	CS	$4.50	$140,685	2y6m	10/1/2007	4/1/2010
Manchester	NH	Manchester	MHT	M	$3.00	$123,305,983	15y	1/1/1993	1/1/2008
Manchester	NH	Manchester	MHT	M	$4.50	**	7y7m	1/1/2008	8/1/2015
Manchester	NH	Manchester	MHT	M	$3.00	$3,033,074	6m	8/1/2015	2/1/2016
Manchester	NH	Manchester	MHT	M	$4.50	$678,332	1m	2/1/2016	3/1/2016
Manchester	NH	Manchester	MHT	M	$3.00	$50,662,827	4y10m	3/1/2016	1/1/2021
Manchester	NH	Manchester	MHT	M	$4.50	$20,702,409	2y	1/1/2021	1/1/2023
Atlantic City	NJ	Atlantic City International	ACY	S	$3.00	$10,494,427	6y2m	10/1/1999	12/1/2005
Atlantic City	NJ	Atlantic City International	ACY	S	$4.50	**	1y5m	12/1/2005	4/1/2007
Atlantic City	NJ	Atlantic City International	ACY	S	$4.50	$10,933,281	4y1m	4/1/2007	5/1/2011
Newark	NJ	Newark Liberty International	EWR	L	$3.00	$919,763,055	13y6m	10/1/1992	4/1/2006
Newark	NJ	Newark Liberty International	EWR	L	$4.50	**	4y11m	4/1/2006	3/1/2011
Trenton	NJ	Trenton Mercer	TTN	N	$3.00	$0	3y4m	1/1/2001	5/1/2004
Trenton	NJ	Trenton Mercer	TTN	N	$4.50	$1,061,436	6y10m	5/1/2004	3/1/2011

Albuquerque	NM	Albuquerque International Sunport	ABQ	M	$3.00	$160,323,675	19y1m	7/1/1996	7/1/2015
Farmington	NM	Four Corners Regional	FMN	N	$3.00	$661,102	7y11m	6/1/2003	5/1/2011
Roswell	NM	Roswell International Air Center	ROW	N	$3.00	$334,477	4y10m	4/1/1999	2/1/2004
Roswell	NM	Roswell International Air Center	ROW	N	$4.50	**	4m	2/1/2004	6/1/2004
Roswell	NM	Roswell International Air Center	ROW	N	$3.00	**	1y	6/1/2004	6/1/2005
Roswell	NM	Roswell International Air Center	ROW	N	$4.50	**	2y8m	6/1/2005	2/1/2008
Roswell	NM	Roswell International Air Center	ROW	N	$4.50	$659,582	5y9m	3/1/2008	12/1/2013
Albany	NY	Albany International	ALB	S	$3.00	$116,740,338	28y10m	3/1/1994	1/1/2023
Binghamton	NY	Greater Binghamton/Edwin A. Link Field	BGM	N	$3.00	$4,684,325	8y10m	11/1/1993	9/1/2002
Binghamton	NY	Greater Binghamton/Edwin A. Link Field	BGM	N	$4.50	**	3y10m	9/1/2002	7/1/2006
Binghamton	NY	Greater Binghamton/Edwin A. Link Field	BGM	N	$4.50	$559,849	3y2m	7/1/2006	2/1/2008
Binghamton	NY	Greater Binghamton/Edwin A. Link Field	BGM	N	$4.50	$2,751,241	2y11m	5/1/2008	4/1/2011
Buffalo	NY	Buffalo Niagara International	BUF	M	$3.00	$142,638,765	14y11m	8/1/1992	8/1/2007
Buffalo	NY	Buffalo Niagara International	BUF	M	$4.50	**	5y	8/1/2007	8/1/2012
Elmira	NY	Elmira/Corning Regional	ELM	N	$3.00	$733,042	3y1m	12/1/2004	1/1/2008
Elmira	NY	Elmira/Corning Regional	ELM	N	$4.50	$641,046	1y10m	5/1/2008	3/1/2010
Islip	NY	Long Island MacArthur	ISP	S	$3.00	$27,066,906	10y9m	12/1/1994	9/1/2005
Islip	NY	Long Island MacArthur	ISP	S	$4.50	$37,133,218	9y8m	9/1/2005	5/1/2015
Ithaca	NY	Ithica Tompkins Regional	ITH	N	$3.00	$6,872,612	16y2m	1/1/1993	3/1/2009
Ithaca	NY	Ithica Tompkins Regional	ITH	N	$4.50	**	7y2m	3/1/2009	5/1/2016
Jamestown	NY	Chautauqua County/Jamestown	JHW	CS	$3.00	$590,896	9y2m	6/1/1993	8/1/2002
Jamestown	NY	Chautauqua County/Jamestown	JHW	CS	$4.50	$200,112	4y10m	9/1/2004	7/1/2009
Massena	NY	Massena International - Richards Field	MSS		$3.00	$163,429	19y7m	4/1/1996	11/1/2015
New York	NY	John F. Kennedy International	JFK	L	$3.00	$972,345,400	13y6m	10/1/1992	4/1/2006
New York	NY	John F. Kennedy International	JFK	L	$4.50	**	4y11m	4/1/2006	3/1/2011
New York	NY	LaGuardia	LGA	L	$3.00	$689,167,604	13y6m	10/1/1992	4/1/2006
New York	NY	LaGuardia	LGA	L	$4.50	**	4y11m	4/1/2006	3/1/2011
Newburgh	NY	Stewart International	SWF	S	$3.00	$8,827,899	6y4m	11/1/1995	3/1/2002
Newburgh	NY	Stewart International	SWF	S	$4.50	**	3y8m	3/1/2002	11/1/2005
Newburgh	NY	Stewart International	SWF	S	$4.50	$254,187	4m	5/1/2007	9/1/2007
Ogdensburg	NY	Ogdensburg Intl	OGS	CS	$3.00	$125,050	23y8m	4/1/1996	12/1/2019
Plattsburgh	NY	Clinton County	PLB		$3.00	$184,658	7y8m	7/1/1993	3/1/2001
Plattsburgh	NY	Clinton County	PLB		$3.00	$46,317	3y10m	6/1/2001	4/1/2003
Plattsburgh	NY	Plattsburgh International	PBG	CS	$4.50	$732,355	2y11m	1/1/2009	12/1/2012
Rochester	NY	Greater Rochester International	ROC	S	$3.00	$20,828,889	6y8m	12/1/1997	9/1/2004
Rochester	NY	Greater Rochester International	ROC	S	$4.50	$77,242,638	16y9m	9/1/2004	6/1/2021
Saranac Lake	NY	Adirondack Regional	SLK	CS	$3.00	$121,952	13y1m	8/1/1994	9/1/2007
Syracuse	NY	Syracuse Hancock International	SYR	S	$3.00	$18,228,294	6y3m	10/1/1995	1/1/2002
Syracuse	NY	Syracuse Hancock International	SYR	S	$4.50	$10,495,193	2y10m	10/1/2002	8/1/2005

Syracuse	NY	Syracuse Hancock International	SYR	S	$4.50	$6,719,197	1y3m	11/1/2005	2/1/2007
Syracuse	NY	Syracuse Hancock International	SYR	S	$4.50	$96,732,010	19y4m	4/1/2007	8/1/2026
Utica	NY	Oneida County	UCA		$3.00	$1,298,631	12y10m	8/1/1997	6/1/2010
White Plains	NY	Westchester County	HPN	S	$3.00	$15,546,537	8y10m	2/1/1993	12/1/2001
White Plains	NY	Westchester County	HPN	S	$4.50	**	2y5m	12/1/2001	5/1/2004
White Plains	NY	Westchester County	HPN	S	$4.50	$34,300,000	9y3m	5/1/2004	8/1/2013
Asheville	NC	Asheville Regional	AVL	N	$3.00	$5,622,844	7y10m	12/1/1994	10/1/2002
Asheville	NC	Asheville Regional	AVL	N	$4.50	$4,936,653	4y1m	10/1/2002	11/1/2006
Asheville	NC	Asheville Regional	AVL	N	$4.50	$478,051	5m	4/1/2007	9/1/2007
Asheville	NC	Asheville Regional	AVL	N	$4.50	$3,521,375	2y7m	10/1/2007	5/1/2010
Charlotte	NC	Charlotte/Douglas International	CLT	L	$3.00	$875,473,518	15y8m	11/1/2004	7/1/2020
Fayetteville	NC	Fayetteville Regional/Grannis Field	FAY	N	$3.00	$1,896,677	5y3m	11/1/2000	2/1/2006
Greenville	NC	Pitt-Greenville	PGV	N	$3.00	$494,486	3y6m	10/1/1997	4/1/2001
Greenville	NC	Pitt-Greenville	PGV	N	$4.50	**	3m	4/1/2001	7/1/2001
Greenville	NC	Pitt-Greenville	PGV	N	$4.50	$714,185	11y1m	7/1/2001	8/1/2012
Jacksonville	NC	Albert J. Ellis	OAJ	N	$3.00	$208,878	2y9m	1/1/1996	10/1/1998
Jacksonville	NC	Albert J. Ellis	OAJ	N	$3.00	*	11m	9/1/1999	8/1/2000
Jacksonville	NC	Albert J. Ellis	OAJ	N	$3.00	$988,225	3y10m	3/1/2005	1/1/2009
Jacksonville	NC	Albert J. Ellis	OAJ	N	$3.00	$428,328	4y6m	2/1/2009	8/1/2013
New Bern	NC	Craven County Regional	EWN	N	$3.00	$10,681,398	6y9m	2/1/1997	11/1/2003
New Bern	NC	Craven County Regional	EWN	N	$4.50	**	21y	11/1/2003	11/1/2024
Raleigh	NC	Raleigh-Durham International	RDU	M	$3.00	$9,778,473	1y6m	4/1/2003	10/1/2004
Raleigh	NC	Raleigh-Durham International	RDU	M	$4.50	$765,251,376	28y11m	10/1/2004	9/1/2032
Wilmington	NC	Wilmington International	ILM	S	$3.00	$1,526,487	2y7m	2/1/1994	9/1/1996
Wilmington	NC	Wilmington International	ILM	S	$3.00	$7,984,994	4y11m	6/1/1998	5/1/2003
Wilmington	NC	Wilmington International	ILM	S	$4.50	**	3y11m	5/1/2003	4/1/2007
Wilmington	NC	Wilmington International	ILM	S	$4.50	$15,574,579	12y6m	4/1/2007	10/1/2019
Bismarck	ND	Bismarck Municipal	BIS	N	$3.00	$349,092	1y	7/1/1996	7/1/1997
Bismarck	ND	Bismarck Municipal	BIS	N	$3.00	$1,342,095	3y10m	6/1/1998	4/1/2002
Bismarck	ND	Bismarck Municipal	BIS	N	$4.50	$6,572,561	12y5m	4/1/2002	9/1/2014
Fargo	ND	Hector International	FAR	N	$3.00	$4,633,814	5y7m	1/1/1997	8/1/2002
Fargo	ND	Hector International	FAR	N	$4.50	**	1y11m	8/1/2002	7/1/2004
Fargo	ND	Hector International	FAR	N	$4.50	$21,050,526	19y1m	7/1/2004	8/1/2023
Grand Forks	ND	Grand Forks International	GFK	N	$3.00	$621,965	3y6m	2/1/1993	8/1/1996
Grand Forks	ND	Grand Forks International	GFK	N	$3.00	$1,707,243	3y11m	5/1/1997	4/1/2001
Grand Forks	ND	Grand Forks International	GFK	N	$4.50	**	2y2m	4/1/2001	6/1/2003
Grand Forks	ND	Grand Forks International	GFK	N	$4.50	$1,506,569	4y5m	5/1/2004	10/1/2008
Grand Forks	ND	Grand Forks International	GFK	N	$4.50	$362,368	1y1m	1/1/2009	2/1/2010
Minot	ND	Minot International	MOT	N	$3.00	$825,445	4y4m	3/1/1994	7/1/1998
Minot	ND	Minot International	MOT	N	$3.00	$990,656	2y11m	3/1/1999	2/1/2002
Minot	ND	Minot International	MOT	N	$4.50	**	1y2m	2/1/2002	4/1/2003
Minot	ND	Minot International	MOT	N	$4.50	$2,432,182	8y3m	4/1/2003	7/1/2011
Akron	OH	Akron-Canton Regional	CAK	S	$3.00	$9,066,039	10y	9/1/1992	9/1/2002
Akron	OH	Akron-Canton Regional	CAK	S	$4.50	$31,034,854	13y8m	9/1/2002	8/1/2016
Cleveland	OH	Cleveland-Hopkins International	CLE	M	$3.00	$199,934,647	9y4m	11/1/1992	3/1/2002

Cleveland	OH	Cleveland-Hopkins International	CLE	M	$4.50	**	2y5m	3/1/2002	8/1/2004
Cleveland	OH	Cleveland-Hopkins International	CLE	M	$4.50	$135,554,000	6y8m	8/1/2004	4/1/2011
Columbus	OH	Port Columbus International	CMH	M	$3.00	$128,445,302	9y6m	10/1/1992	4/1/2002
Columbus	OH	Port Columbus International	CMH	M	$4.50	**	2y6m	4/1/2002	10/1/2004
Columbus	OH	Port Columbus International	CMH	M	$4.50	$138,748,861	8y3m	10/1/2004	1/1/2013
Dayton	OH	James M Cox Dayton International	DAY	S	$3.00	$28,098,728	6y11m	10/1/1994	9/1/2001
Dayton	OH	James M Cox Dayton International	DAY	S	$4.50	**	1y10m	9/1/2001	7/1/2003
Dayton	OH	James M Cox Dayton International	DAY	S	$4.50	$97,523,200	14y7m	7/1/2003	2/1/2018
Toledo	OH	Toledo Express	TOL	N	$3.00	$2,246,374	3y	9/1/1993	9/1/1996
Toledo	OH	Toledo Express	TOL	N	$3.00	$6,442,493	4y	7/1/1997	7/1/2001
Toledo	OH	Toledo Express	TOL	N	$4.50	**	2y6m	7/1/2001	1/1/2004
Toledo	OH	Toledo Express	TOL	N	$4.50	$5,312,436	5y11m	1/1/2004	12/1/2010
Youngstown	OH	Youngstown-Warren Regional	YNG	N	$3.00	$214,384	2y2m	5/1/1994	7/1/1996
Youngstown	OH	Youngstown-Warren Regional	YNG	N	$3.00	$477,044	4y6m	8/1/1997	2/1/2002
Youngstown	OH	Youngstown-Warren Regional	YNG	N	$4.50	$441,000	5y5m	4/1/2007	9/1/2012
Lawton	OK	Lawton-Fort Sill Regional	LAW	N	$2.00	$452,189	1y5m	8/1/1992	1/1/1994
Lawton	OK	Lawton-Fort Sill Regional	LAW	N	$3.00	**	2y3m	1/1/1994	4/1/1996
Lawton	OK	Lawton-Fort Sill Regional	LAW	N	$3.00	$380,745	2y7m	1/1/1998	8/1/2000
Lawton	OK	Lawton-Fort Sill Regional	LAW	N	$4.50	$303,687	1y9m	6/1/2002	3/1/2004
Lawton	OK	Lawton-Fort Sill Regional	LAW	N	$4.50	$249,492	1y1m	9/1/2004	10/1/2005
Lawton	OK	Lawton-Fort Sill Regional	LAW	N	$4.50	$1,269,888	6y	11/1/2007	11/1/2013
Oklahoma City	OK	Will Rogers World	OKC	S	$3.00	$131,260,905	21y7m	7/1/1997	2/1/2019
Tulsa	OK	Tulsa International	TUL	S	$3.00	$15,986,724	3y7m	8/1/1992	3/1/1996
Tulsa	OK	Tulsa International	TUL	S	$3.00	$124,680,653	29y8m	1/1/1997	9/1/2026
Eugene	OR	Mahlon Sweet Field	EUG	N	$3.00	$6,537,176	7y7m	11/1/1993	6/1/2001
Eugene	OR	Mahlon Sweet Field	EUG	N	$4.50	$14,683,202	10y6m	6/1/2001	12/1/2011
Klamath Falls	OR	Klamath Falls	LMT	N	$3.00	$426,251	1y1m	3/1/2000	4/1/2001
Klamath Falls	OR	Klamath Falls	LMT	N	$4.50	**	3y1m	4/1/2001	5/1/2004
Klamath Falls	OR	Klamath Falls	LMT	N	$4.50	$877,799	7y7m	5/1/2004	12/1/2011
Medford	OR	Rogue Valley International - Medford	MFR	N	$3.00	$4,881,207	7y9m	7/1/1993	4/1/2001
Medford	OR	Rogue Valley International - Medford	MFR	N	$4.50	**	2y	4/1/2001	4/1/2003
Medford	OR	Rogue Valley International - Medford	MFR	N	$4.50	$28,781,931	22y4m	4/1/2003	8/1/2025
North Bend	OR	Southwest Oregon Regional	OTH	N	$3.00	$565,252	7y6m	2/1/1994	8/1/2001
North Bend	OR	Southwest Oregon Regional	OTH	N	$4.50	**	4y6m	8/1/2001	2/1/2006
North Bend	OR	Southwest Oregon Regional	OTH	N	$4.50	$2,610,078	15y10m	2/1/2006	12/1/2021
Pendleton	OR	Eastern Oregon Regional at Pendleton	PDT	CS	$3.00	$486,540	16y1m	12/1/1995	1/1/2012
Portland	OR	Portland International	PDX	M	$3.00	$613,687,685	9y3m	7/1/1992	10/1/2001
Portland	OR	Portland International	PDX	M	$4.50	**	14y7m	10/1/2001	5/1/2016
Portland	OR	Portland International	PDX	M	$4.50	$68,207,251	1y10m	5/1/2016	3/1/2018
Redmond	OR	Roberts Field	RDM	N	$3.00	$3,517,536	8y1m	10/1/1993	11/1/2001
Redmond	OR	Roberts Field	RDM	N	$4.50	**	2y1m	11/1/2001	12/1/2003
Redmond	OR	Roberts Field	RDM	N	$4.50	$2,083,546	3y	12/1/2003	12/1/2006

Redmond	OR	Roberts Field	RDM	N	$4.50	$27,930,168	33y4m	3/1/2007	7/1/2040
Allentown	PA	Lehigh Valley International	ABE	S	$3.00	$11,092,349	8y3m	11/1/1992	2/1/2001
Allentown	PA	Lehigh Valley International	ABE	S	$3.00	$2,807,572	5m	6/1/2001	11/1/2001
Allentown	PA	Lehigh Valley International	ABE	S	$4.50	**	1y2m	11/1/2001	1/1/2003
Allentown	PA	Lehigh Valley International	ABE	S	$4.50	$31,075,601	14y11m	9/1/2003	8/1/2018
Altoona	PA	Altoona-Blair County	AOO	CS	$3.00	$110,500	2y9m	5/1/1993	2/1/1996
Altoona	PA	Altoona-Blair County	AOO	CS	$3.00	$116,620	2y9m	1/1/1997	10/1/1999
Altoona	PA	Altoona-Blair County	AOO	CS	$3.00	$298,660	8y5m	7/1/2000	12/1/2008
Altoona	PA	Altoona-Blair County	AOO	CS	$4.50	**	3y	12/1/2008	12/1/2011
Altoona	PA	Altoona-Blair County	AOO	CS	$4.50	$139,918	3y	12/1/2011	12/1/2014
Bradford	PA	Bradford Regional	BFD	CS	$3.00	$206,793	7y9m	8/1/1995	5/1/2003
Bradford	PA	Bradford Regional	BFD	CS	$4.50	$446,548	14y6m	5/1/2003	11/1/2017
Du Bois	PA	Du Bois-Jefferson County	DUJ	CS	$3.00	$386,636	5y10m	6/1/1995	4/1/2001
Du Bois	PA	Du Bois-Jefferson County	DUJ	CS	$4.50	**	2y7m	4/1/2001	11/1/2003
Du Bois	PA	Du Bois-Jefferson County	DUJ	CS	$4.50	$325,413	9y6m	4/1/2004	10/1/2013
Erie	PA	Erie International/Tom Ridge Field	ERI	N	$3.00	$2,022,109	4y8m	10/1/1992	6/1/1997
Erie	PA	Erie International/Tom Ridge Field	ERI	N	$3.00	$1,216,914	3y5m	12/1/1997	5/1/2001
Erie	PA	Erie International/Tom Ridge Field	ERI	N	$4.50	$618,885	1y5m	8/1/2003	1/1/2005
Erie	PA	Erie International/Tom Ridge Field	ERI	N	$4.50	$22,289,976	19y7m	7/1/2005	2/1/2025
Harrisburg	PA	Harrisburg International	MDT	S	$3.00	$17,744,614	5y11m	2/1/1997	1/1/2003
Harrisburg	PA	Harrisburg International	MDT	S	$4.50	$118,372,500	31y6m	1/1/2003	7/1/2034
Johnstown	PA	John Murtha Johnstown-Cambria County	JST	CS	$3.00	$148,269	3y1m	11/1/1993	12/1/1996
Johnstown	PA	John Murtha Johnstown-Cambria County	JST	CS	$3.00	$510,227	5y4m	12/1/1997	5/1/2001
Johnstown	PA	John Murtha Johnstown-Cambria County	JST	CS	$4.50	**	5y8m	5/1/2001	1/1/2007
Johnstown	PA	John Murtha Johnstown-Cambria County	JST	CS	$4.50	$132,000	2y9m	7/1/2007	4/1/2010
Lancaster	PA	Lancaster	LNS	CS	$3.00	$1,483,000	14y	2/1/1995	2/1/2009
Latrobe	PA	Arnold Palmer Regional	LBE	N	$3.00	$1,397,687	17y2m	3/1/1996	5/1/2013
Philadelphia	PA	Philadelphia International	PHL	L	$3.00	$1,141,562,798	8y7m	9/1/1992	4/1/2001
Philadelphia	PA	Philadelphia International	PHL	L	$4.50	**	11y10m	4/1/2001	2/1/2013
Philadelphia	PA	Philadelphia International	PHL	L	$3.00	$24,400,000	5m	2/1/2013	7/1/2013
Philadelphia	PA	Philadelphia International	PHL	L	$4.50	$238,950,000	4y9m	7/1/2013	4/1/2018
Pittsburgh	PA	Pittsburgh International	PIT	M	$3.00	$100,098,648	3y2m	10/1/2001	12/1/2004
Pittsburgh	PA	Pittsburgh International	PIT	M	$4.50	**	1y9m	12/1/2004	9/1/2006
Pittsburgh	PA	Pittsburgh International	PIT	M	$4.50	$417,566,028	18y3m	9/1/2006	12/1/2024
Reading	PA	Reading Regional/Carl A Spaatz Field	RDG		$3.00	$1,692,031	13y7m	12/1/1994	7/1/2008
State College	PA	University Park	UNV/SCE	N	$3.00	$4,448,552	11y	11/1/1992	11/1/2003
State College	PA	University Park	UNV/SCE	N	$4.50	**	2y8m	11/1/2003	7/1/2006
State College	PA	University Park	UNV/SCE	N	$4.50	$5,758,562	8y5m	7/1/2006	12/1/2014
Wilkes-Barre	PA	Wilkes-Barre/Scranton International	AVP	N	$3.00	$4,588,122	3y6m	12/1/1993	6/1/1997

Wilkes-Barre	PA	Wilkes-Barre/Scranton International	AVP	N	$3.00	*	3y5m	12/1/1997	5/1/2001
Wilkes-Barre	PA	Wilkes-Barre/Scranton International	AVP	N	$4.50	$15,298,006	16y3m	5/1/2001	8/1/2017
Williamsport	PA	Williamsport Regional	IPT	N	$3.00	$132,488	1y6m	5/1/1997	11/1/1998
Aguadilla	PR	Rafael Hernandez	BQN	N	$3.00	$0	3y2m	3/1/1993	5/1/1996
Aguadilla	PR	Rafael Hernandez	BQN	N	$4.50	$9,828,476	16y	12/1/2005	12/1/2021
Ponce	PR	Mercedita	PSE	N	$3.00	$866,000	5y5m	3/1/1993	9/1/1998
San Juan	PR	Luis Munoz Marin International	SJU	M	$3.00	$222,126,971	12y9m	3/1/1993	12/1/2005
San Juan	PR	Luis Munoz Marin International	SJU	M	$4.50	**	2y6m	12/1/2005	6/1/2008
San Juan	PR	Luis Munoz Marin International	SJU	M	$4.50	$339,135,482	18y11m	6/1/2008	5/1/2027
Providence	RI	Theodore Francis Green State	PVD	M	$3.00	$104,029,700	12y7m	2/1/1994	9/1/2006
Providence	RI	Theodore Francis Green State	PVD	M	$4.50	**	1y11m	9/1/2006	8/1/2008
Providence	RI	Theodore Francis Green State	PVD	M	$4.50	$66,396,031	4y8m	8/1/2008	4/1/2013
Columbia	SC	Columbia Metropolitan	CAE	S	$3.00	$70,528,884	8y1m	11/1/1993	12/1/2001
Columbia	SC	Columbia Metropolitan	CAE	S	$4.50	**	9y	12/1/2001	12/1/2010
Florence	SC	Florence Regional	FLO	N	$3.00	$669,334	3y11m	12/1/1995	11/1/1999
Florence	SC	Florence Regional	FLO	N	$3.00	*	2m	12/1/1999	2/1/2000
Hilton Head Island	SC	Hilton Head	HXD/HHH	N	$3.00	$1,542,300	6y4m	2/1/1994	6/1/2000
Hilton Head Island	SC	Hilton Head	HXD/HHH	N	$3.00	$2,076,657	6y10m	12/1/2000	10/1/2007
Myrtle Beach	SC	Myrtle Beach International	MYR	S	$3.00	$27,941,134	5y10m	10/1/1996	8/1/2001
Myrtle Beach	SC	Myrtle Beach International	MYR	S	$4.50	**	6y	8/1/2001	8/1/2007
Aberdeen	SD	Aberdeen Regional	ABR	N	$3.00	$677,809	2y	1/1/2000	1/1/2002
Aberdeen	SD	Aberdeen Regional	ABR	N	$4.50	**	5y5m	1/1/2002	6/1/2007
Aberdeen	SD	Aberdeen Regional	ABR	N	$4.50	$533,588	2y9m	6/1/2007	3/1/2010
Pierre	SD	Pierre Regional	PIR	N	$4.50	$366,239	6y5m	2/1/2003	7/1/2009
Rapid City	SD	Rapid City Regional	RAP	N	$3.00	$1,087,206	2y5m	8/1/1997	1/1/2000
Rapid City	SD	Rapid City Regional	RAP	N	$3.00	$4,146,262	6y	6/1/2000	6/1/2006
Rapid City	SD	Rapid City Regional	RAP	N	$4.50	**	9m	6/1/2006	5/1/2007
Rapid City	SD	Rapid City Regional	RAP	N	$4.50	$2,106,280	2y1m	5/1/2007	6/1/2009
Bristol	TN	Tri-Cities Regional TN/VA	TRI	N	$3.00	$10,521,507	10y5m	2/1/1997	7/1/2007
Bristol	TN	Tri-Cities Regional TN/VA	TRI	N	$4.50	**	4y8m	7/1/2007	3/1/2012
Bristol	TN	Tri-Cities Regional TN/VA	TRI	N	$4.50	$1,264,140	2y7m	3/1/2012	10/1/2014
Chattanooga	TN	Lovell Field	CHA	N	$3.00	$15,406,237	6y9m	7/1/1994	4/1/2001
Chattanooga	TN	Lovell Field	CHA	N	$4.50	**	3y7m	4/1/2001	11/1/2004
Chattanooga	TN	Lovell Field	CHA	N	$3.00	**	3m	11/1/2004	2/1/2005
Chattanooga	TN	Lovell Field	CHA	N	$4.50	**	5y6m	2/1/2005	8/1/2010
Chattanooga	TN	Lovell Field	CHA	N	$4.50	$2,329,992	2y2m	8/1/2010	10/1/2012
Jackson	TN	McKellar-Sipes Regional	MKL		$4.50	$332,248	7y8m	10/1/2002	6/1/2010
Knoxville	TN	Mc Ghee Tyson	TYS	S	$3.00	$99,080,294	9y9m	1/1/1994	10/1/2003
Knoxville	TN	Mc Ghee Tyson	TYS	S	$4.50	**	18y9m	10/1/2003	7/1/2022
Knoxville	TN	Mc Ghee Tyson	TYS	S	$4.50	$4,691,627	1y2m	7/1/2022	9/1/2023
Memphis	TN	Memphis International	MEM	M	$3.00	$53,700,000	4y5m	8/1/1992	1/1/1997
Nashville	TN	Nashville International	BNA	M	$3.00	$330,616,863	23y	1/1/1993	1/1/2016
Abilene	TX	Abilene Regional	ABI	N	$3.00	$2,008,611	4y8m	1/1/1998	9/1/2002
Abilene	TX	Abilene Regional	ABI	N	$4.50	**	5y10m	9/1/2002	7/1/2008
Abilene	TX	Abilene Regional	ABI	N	$4.50	$2,519,008	7y1m	7/1/2008	8/1/2015

Amarillo	TX	Rick Husband Amarillo International	AMA	S	$4.50	$19,200,000	9y7m	12/1/2008	7/1/2018
Austin	TX	Robert Mueller Municipal	AUS	M	$2.00	$6,189,459	3m	11/1/1993	2/1/1994
Austin	TX	Robert Mueller Municipal	AUS	M	$3.00	**	1y	2/1/1994	2/1/1995
Austin	TX	Austin-Bergstrom International	AUS	M	$3.00	$343,074,546	8y9m	7/1/1995	4/1/2004
Austin	TX	Austin-Bergstrom International	AUS	M	$4.50	**	15y9m	4/1/2004	1/1/2020
Austin	TX	Austin-Bergstrom International	AUS	M	$4.50	$4,125,000	4m	1/1/2020	5/1/2020
Beaumont/Port Arthur	TX	Southeast Texas Regional	BPT	N	$3.00	$2,767,768	7y6m	9/1/1994	3/1/2002
Beaumont/Port Arthur	TX	Southeast Texas Regional	BPT	N	$4.50	**	3y1m	3/1/2002	4/1/2005
Beaumont/Port Arthur	TX	Southeast Texas Regional	BPT	N	$4.50	$964,833	4y4m	4/1/2005	8/1/2009
Brownsville	TX	Brownsville/South Padre Island International	BRO	N	$3.00	$1,099,404	5y7m	10/1/1997	5/1/2003
Brownsville	TX	Brownsville/South Padre Island International	BRO	N	$4.50	$5,182,363	15y7m	5/1/2003	12/1/2018
College Station	TX	Easterwood Field	CLL	N	$3.00	$2,063,797	4y9m	7/1/1996	4/1/2001
College Station	TX	Easterwood Field	CLL	N	$4.50	**	2y9m	4/1/2001	1/1/2004
College Station	TX	Easterwood Field	CLL	N	$4.50	$3,491,666	9y	1/1/2004	1/1/2013
Corpus Christi	TX	Corpus Christi International	CRP	S	$3.00	$49,700,114	9y1m	3/1/1994	3/1/2003
Corpus Christi	TX	Corpus Christi International	CRP	S	$4.50	**	23y10m	3/1/2003	1/1/2027
Dallas	TX	Dallas Love Field	DAL	M	$3.00	$38,994,339	3y8m	2/1/2008	10/1/2011
Dallas-Ft Worth	TX	Dallas/Ft Worth International	DFW	L	$3.00	$93,687,528	2y1m	5/1/1994	6/1/1996
Dallas-Ft Worth	TX	Dallas/Ft Worth International	DFW	L	$3.00	$2,394,925,313	5y5m	2/1/1997	7/1/2002
Dallas-Ft Worth	TX	Dallas/Ft Worth International	DFW	L	$4.50	**	14y8m	7/1/2002	3/1/2017
Dallas-Ft Worth	TX	Dallas/Ft Worth International	DFW	L	$3.00	$51,900,495	2m	3/1/2017	5/1/2017
Dallas-Ft Worth	TX	Dallas/Ft Worth International	DFW	L	$4.50	$2,988,512,952	17y4m	5/1/2017	9/1/2034
El Paso	TX	El Paso International	ELP	S	$3.00	$76,826,242	15y5m	1/1/1997	6/1/2012
Harlingen	TX	Valley International	HRL	S	$3.00	$9,683,579	9y1m	11/1/1998	12/1/2007
Harlingen	TX	Valley International	HRL	S	$4.50	$7,885,824	3y7m	12/1/2007	7/1/2011
Houston	TX	William P. Hobby	HOU	M	$3.00	$163,517,150	12y	11/1/2006	11/1/2017
Houston	TX	George Bush Intercontinental/ Houston	IAH	L	$3.00	$1,372,445,143	18y11m	12/1/2008	11/1/2027
Killeen	TX	Killeen Municipal	ILE	N	$3.00	$242,051	1y10m	1/1/1993	11/1/1994
Killeen	TX	Killeen Municipal	ILE	N	$3.00	$3,579,834	6y1m	4/1/1995	5/1/2001
Killeen	TX	Killeen Municipal	ILE	N	$4.50	**	2y3m	5/1/2001	8/1/2003
Killeen	TX	Robert Gray AAF	ILE/GRK	N	$4.50	*	2y1m	12/1/2003	1/1/2006
Killeen	TX	Robert Gray AAF	GRK	N	$4.50	$2,713,561	3y9m	6/1/2006	3/1/2010
Laredo	TX	Laredo International	LRD	N	$3.00	$6,303,839	19y3m	10/1/1993	1/1/2013
Laredo	TX	Laredo International	LRD	N	$4.50	$7,852,765	9y5m	1/1/2013	6/1/2022
Longview	TX	East Texas Regional	GGG	N	$3.00	$472,571	5y7m	9/1/1996	4/1/2002
Longview	TX	East Texas Regional	GGG	N	$3.00	$699,232	8y8m	9/1/2002	5/1/2011
Lubbock	TX	Lubbock Preston Smith International	LBB	S	$3.00	$16,178,722	11y4m	10/1/1993	2/1/2005
Lubbock	TX	Lubbock Preston Smith International	LBB	S	$2.00	$5,280,392	2y	2/1/2005	2/1/2007
Lubbock	TX	Lubbock Preston Smith International	LBB	S	$3.00	$14,974,139	1y4m	2/1/2007	6/1/2008
Lubbock	TX	Lubbock Preston Smith International	LBB	S	$4.50	**	5y	6/1/2008	6/1/2013
McAllen	TX	McAllen Miller International	MFE	S	$3.00	$15,110,767	15y6m	4/1/1998	10/1/2013

Midland	TX	Midland International	MAF	S	$3.00	$35,873,495	11y9m	1/1/1993	9/1/2004
Midland	TX	Midland International	MAF	S	$4.50	**	9y4m	9/1/2004	1/1/2014
Midland	TX	Midland International	MAF	S	$3.00	$1,395,921	10m	1/1/2014	11/1/2014
Midland	TX	Midland International	MAF	S	$4.50	$1,544,032	9m	11/1/2014	8/1/2015
San Angelo	TX	San Angelo Regional/Mathis Field	SJT	N	$3.00	$1,266,877	8y11m	5/1/1993	4/1/2002
San Angelo	TX	San Angelo Regional/Mathis Field	SJT	N	$4.50	**	2y4m	4/1/2002	8/1/2004
San Angelo	TX	San Angelo Regional/Mathis Field	SJT	N	$4.50	$1,953,741	8y1m	8/1/2004	9/1/2012
San Antonio	TX	San Antonio International	SAT	M	$3.00	$238,029,391	5y11m	11/1/2001	10/1/2007
San Antonio	TX	San Antonio International	SAT	M	$4.50	**	5y3m	10/1/2007	1/1/2013
San Antonio	TX	San Antonio International	SAT	M	$4.50	$142,929,158	6y2m	1/1/2013	3/1/2019
Tyler	TX	Tyler Pounds Regional	TYR	N	$3.00	$2,901,212	9y6m	3/1/1994	9/1/2003
Tyler	TX	Tyler Pounds Regional	TYR	N	$4.50	**	4y11m	9/1/2003	8/1/2008
Tyler	TX	Tyler Pounds Regional	TYR	N	$4.50	$2,140,662	8y9m	8/1/2008	5/1/2017
Victoria	TX	Victoria Regional	VCT	CS	$3.00	$195,960	3y	12/1/1994	8/1/1998
Victoria	TX	Victoria Regional	VCT	CS	$3.00	$188,872	3y	1/1/1999	1/1/2002
Victoria	TX	Victoria Regional	VCT	CS	$4.50	$444,905	10y	1/1/2002	1/1/2012
Waco	TX	Waco Regional	ACT	N	$3.00	$2,438,451	5y11m	11/1/1995	10/1/2001
Waco	TX	Waco Regional	ACT	N	$4.50	**	6y3m	10/1/2001	1/1/2008
Waco	TX	Waco Regional	ACT	N	$4.50	$668,255	2y1m	1/1/2008	2/1/2010
Wichita Falls	TX	Sheppard AFB/Wichita Falls Municipal	SPS	N	$4.50	$1,646,268	9y2m	10/1/2008	12/1/2017
Cedar City	UT	Cedar City Regional	CDC	CS	$4.50	$229,900	4y8m	2/1/2007	10/1/2011
Salt Lake City	UT	Salt Lake City International	SLC	L	$3.00	$166,173,468	6y4m	12/1/1994	4/1/2001
Salt Lake City	UT	Salt Lake City International	SLC	L	$4.50	**	3m	4/1/2001	7/1/2001
Salt Lake City	UT	Salt Lake City International	SLC	L	$4.50	$299,058,059	8y7m	7/1/2001	2/1/2010
St George	UT	St George Municipal	SGU	N	$3.00	$23,568	4y4m	5/1/1998	9/1/2002
St George	UT	St George Municipal	SGU	N	$4.50	$3,515,402	12y7m	6/1/2003	1/1/2016
Wendover	UT	Wendover	ENV		$3.00	$142,300	3y2m	8/1/1996	10/1/1999
Charlotte Amalie	VI	Cyril E. King	STT	S	$3.00	$3,808,574	2y5m	3/1/1993	8/1/1995
Charlotte Amalie	VI	Cyril E. King	STT	S	$3.00	$7,792,000	7y	12/1/1995	12/1/2002
Charlotte Amalie	VI	Cyril E. King	STT	S	$3.00	$13,500,000	7y9m	8/1/2004	4/1/2012
Christiansted	VI	Henry E. Rohlsen	STX	N	$3.00	$2,158,095	3y1m	3/1/1993	4/1/1996
Christiansted	VI	Henry E. Rohlsen	STX	N	$3.00	$4,408,000	6y7m	12/1/1996	7/1/2003
Burlington	VT	Burlington International	BTV	S	$3.00	$25,408,285	6y5m	4/1/1997	9/1/2003
Burlington	VT	Burlington International	BTV	S	$4.50	**	6y1m	9/1/2003	10/1/2009
Arlington	VA	Ronald Reagan Washington National	DCA	L	$3.00	$322,807,356	7y6m	11/1/1993	5/1/2001
Arlington	VA	Ronald Reagan Washington National	DCA	L	$4.50	**	4y1m	5/1/2001	6/1/2005
Arlington	VA	Ronald Reagan Washington National	DCA	L	$4.50	$305,413,857	9y9m	6/1/2005	3/1/2015
Chantilly	VA	Washington Dulles International	IAD	L	$3.00	$274,241,263	7y6m	1/1/1994	5/1/2001
Chantilly	VA	Washington Dulles International	IAD	L	$4.50	**	4y3m	5/1/2001	8/1/2005
Chantilly	VA	Washington Dulles International	IAD	L	$4.50	$2,177,852,082	33y5m	8/1/2005	1/1/2039
Charlottesville	VA	Charlottesville-Albemarle	CHO	N	$2.00	$305,992	1y1m	9/1/1992	10/1/1993
Charlottesville	VA	Charlottesville-Albemarle	CHO	N	$3.00	$5,114,437	9y9m	4/1/1995	1/1/2005
Charlottesville	VA	Charlottesville-Albemarle	CHO	N	$4.50	**	1y1m	1/1/2005	2/1/2006

Charlottesville	VA	Charlottesville-Albemarle	CHO	N	$4.50	$4,099,484	3y11m	2/1/2006	1/1/2010
Lynchburg	VA	Lynchburg Regional/Preston Glenn Field	LYH	N	$3.00	$185,940	1y	7/1/1995	7/1/1996
Lynchburg	VA	Lynchburg Regional/Preston Glenn Field	LYH	N	$3.00	$827,616	1y9m	9/1/2000	6/1/2002
Lynchburg	VA	Lynchburg Regional/Preston Glenn Field	LYH	N	$4.50	$2,309,770	13y	6/1/2002	6/1/2015
Newport News	VA	Newport News/Williamsburg International	PHF	S	$3.00	$552,500	9m	10/1/2006	7/1/2007
Norfolk	VA	Norfolk International	ORF	S	$3.00	$51,961,000	12y11m	5/1/1997	4/1/2010
Richmond	VA	Richmond International	RIC	S	$3.00	$137,014,261	10y7m	5/1/1994	1/1/2005
Richmond	VA	Richmond International	RIC	S	$4.50	**	14y10m	1/1/2005	10/1/2019
Roanoke	VA	Roanoke Regional/Woodrum Field	ROA	N	$3.00	$6,463,183	3y3m	9/1/1998	12/1/2001
Roanoke	VA	Roanoke Regional/Woodrum Field	ROA	N	$4.50	**	3y2m	12/1/2001	2/1/2005
Roanoke	VA	Roanoke Regional/Woodrum Field	ROA	N	$3.00	$8,483,280	9m	2/1/2005	11/1/2005
Roanoke	VA	Roanoke Regional/Woodrum Field	ROA	N	$4.50	**	6y	11/1/2005	11/1/2011
Staunton	VA	Shenandoah Valley Regional	SHD	CS	$3.00	$207,875	5y	12/1/2001	12/1/2006
Staunton	VA	Shenandoah Valley Regional	SHD	CS	$4.50	$244,811	10y9m	6/1/2007	3/1/2018
Bellingham	WA	Bellingham International	BLI	N	$3.00	$1,594,527	5y1m	7/1/1993	8/1/1998
Bellingham	WA	Bellingham International	BLI	N	$3.00	*	10m	3/1/1999	1/1/2000
Bellingham	WA	Bellingham International	BLI	N	$3.00	$1,400,000	2y6m	1/1/2000	7/1/2002
Bellingham	WA	Bellingham International	BLI	N	$4.50	**	2y11m	7/1/2002	6/1/2005
Bellingham	WA	Bellingham International	BLI	N	$4.50	$5,245,837	9y3m	6/1/2005	9/1/2014
Friday Harbor	WA	Friday Harbor	FRD/FHR	CS	$3.00	$517,077	15y5m	2/1/2001	7/1/2016
Moses Lake	WA	Grant County International	MWH		$3.00	$470,000	6y8m	3/1/1999	11/1/2005
Moses Lake	WA	Grant County International	MWH		$4.50	**	10y2m	11/1/2005	1/1/2016
Pasco	WA	Tri-Cities	PSC	N	$3.00	$3,657,898	7y11m	11/1/1993	10/1/2001
Pasco	WA	Tri-Cities	PSC	N	$4.50	**	1y6m	10/1/2001	4/1/2003
Pasco	WA	Tri-Cities	PSC	N	$4.50	$10,404,363	10y7m	4/1/2003	11/1/2013
Port Angeles	WA	William R. Fairchild International	CLM	CS	$3.00	$117,556	1y9m	8/1/1993	5/1/1995
Port Angeles	WA	William R. Fairchild International	CLM	CS	$3.00	$889,322	16y2m	9/1/1996	11/1/2012
Pullman	WA	Pullman/Moscow Regional	PUW	N	$3.00	$169,288	2y8m	6/1/1994	2/1/1996
Pullman	WA	Pullman/Moscow Regional	PUW	N	$3.00	$706,727	1y11m	2/1/2000	1/1/2002
Pullman	WA	Pullman/Moscow Regional	PUW	N	$4.50	**	3y9m	1/1/2002	10/1/2005
Pullman	WA	Pullman/Moscow Regional	PUW	N	$4.50	$678,185	7y3m	10/1/2005	1/1/2013
Seattle	WA	Seattle-Tacoma International	SEA	L	$3.00	$76,701,322	8y11m	11/1/1992	10/1/2001
Seattle	WA	Seattle-Tacoma International	SEA	L	$4.50	**	1y5m	10/1/2001	1/1/2003
Seattle	WA	Seattle-Tacoma International	SEA	L	$4.50	$1,086,205,000	11y5m	1/1/2003	6/1/2014
Spokane	WA	Spokane International	GEG	S	$3.00	$52,372,419	9y10m	6/1/1993	4/1/2003
Spokane	WA	Spokane International	GEG	S	$4.50	**	2y1m	4/1/2003	5/1/2005
Spokane	WA	Spokane International	GEG	S	$4.50	$43,262,293	6y11m	5/1/2005	4/1/2012
Walla Walla	WA	Walla Walla Regional	ALW	N	$3.00	$3,745,775	7y11m	11/1/1993	10/1/2001

Walla Walla	WA	Walla Walla Regional	ALW	N	$4.50	**	18y	10/1/2001	10/1/2019
Wenatchee	WA	Pangborn Memorial	EAT	N	$3.00	$622,488	2y2m	8/1/1993	10/1/1995
Wenatchee	WA	Pangborn Memorial	EAT	N	$3.00	$660,570	4y1m	6/1/1998	7/1/2002
Wenatchee	WA	Pangborn Memorial	EAT	N	$4.50	**	7m	7/1/2002	2/1/2003
Wenatchee	WA	Pangborn Memorial	EAT	N	$4.50	$1,151,290	6y9m	5/1/2003	2/1/2010
Yakima	WA	Yakima Air Terminal/McAllister Field	YKM	N	$3.00	$1,565,797	6y	2/1/1993	2/1/1999
Yakima	WA	Yakima Air Terminal/McAllister Field	YKM	N	$3.00	*	1y1m	5/1/1999	6/1/2000
Yakima	WA	Yakima Air Terminal/McAllister Field	YKM	N	$3.00	$2,218,639	11y5m	6/1/2000	11/1/2011
Charleston	WV	Yeager	CRW	N	$3.00	$6,007,527	8y3m	8/1/1993	11/1/2001
Charleston	WV	Yeager	CRW	N	$4.50	**	1y5m	11/1/2001	4/1/2003
Charleston	WV	Yeager	CRW	N	$4.50	$12,492,586	9y7m	4/1/2003	11/1/2012
Clarksburg	WV	North Central West Virginia	CKB	CS	$3.00	$79,103	2y1m	3/1/1994	10/1/1995
Clarksburg	WV	North Central West Virginia	CKB	CS	$4.50	$101,489	1y10m	4/1/2001	8/1/2002
Clarksburg	WV	North Central West Virginia	CKB	CS	$4.50	$2,920,641	50y	5/1/2004	5/1/2054
Huntington	WV	Tri-State/Milton J. Ferguson Field	HTS	N	$3.00	$2,345,472	13y	12/1/1995	12/1/2008
Huntington	WV	Tri-State/Milton J. Ferguson Field	HTS	N	$3.00	$1,122,712	4y4m	5/1/2009	9/1/2013
Morgantown	WV	Morgantown Municipal-Walter L. Bill Hart Field	MGW	CS	$2.00	$54,012	1y1m	12/1/1992	1/1/1994
Morgantown	WV	Morgantown Municipal-Walter L. Bill Hart Field	MGW	CS	$2.00	$341,533	7y1m	12/1/1994	1/1/2002
Morgantown	WV	Morgantown Municipal-Walter L. Bill Hart Field	MGW	CS	$4.50	**	2y5m	1/1/2002	6/1/2004
Morgantown	WV	Morgantown Municipal-Walter L. Bill Hart Field	MGW	CS	$4.50	$227,618	3y9m	6/1/2004	3/1/2008
Parkersburg	WV	Mid-Ohio Valley Regional	PKB	CS	$3.00	$305,491	3y3m	5/1/1999	8/1/2002
Parkersburg	WV	Mid-Ohio Valley Regional	PKB	CS	$4.50	$286,543	13y5m	8/1/2003	1/1/2016
Appleton	WI	Outagamie County Regional	ATW	N	$3.00	$10,466,940	11y11m	7/1/1994	6/1/2006
Appleton	WI	Outagamie County Regional	ATW	N	$4.50	**	1y10m	6/1/2006	4/1/2008
Appleton	WI	Outagamie County Regional	ATW	N	$3.00	$318,410	5m	4/1/2008	9/1/2008
Appleton	WI	Outagamie County Regional	ATW	N	$4.50	$4,717,500	4y4m	9/1/2008	1/1/2013
Eau Claire	WI	Chippewa Valley Regional	EAU	N	$3.00	$708,253	5y10m	2/1/1996	12/1/2001
Eau Claire	WI	Chippewa Valley Regional	EAU	N	$4.50	**	4y1m	12/1/2001	1/1/2006
Eau Claire	WI	Chippewa Valley Regional	EAU	N	$4.50	$662,411	7y9m	8/1/2006	5/1/2014
Green Bay	WI	Austin Straubel International	GRB	S	$3.00	$7,530,958	9y	3/1/1993	3/1/2002
Green Bay	WI	Austin Straubel International	GRB	S	$4.50	$38,768,829	18y7m	3/1/2002	10/1/2020
La Crosse	WI	La Crosse Municipal	LSE	N	$3.00	$1,964,469	6y9m	7/1/1994	4/1/2001
La Crosse	WI	La Crosse Municipal	LSE	N	$4.50	**	6m	4/1/2001	10/1/2001
La Crosse	WI	La Crosse Municipal	LSE	N	$4.50	$5,709,707	14y1m	10/1/2001	11/1/2015
Madison	WI	Dane County Regional - Truax Field	MSN	S	$3.00	$12,308,713	8y2m	9/1/1993	11/1/2001
Madison	WI	Dane County Regional - Truax Field	MSN	S	$4.50	$79,902,856	21y11m	11/1/2001	10/1/2023
Milwaukee	WI	General Mitchell International	MKE	M	$3.00	$310,681,013	29y9m	5/1/1995	2/1/2025
Mosinee	WI	Central Wisconsin	CWA	N	$3.00	$7,725,600	13y10m	11/1/1993	9/1/2007
Mosinee	WI	Central Wisconsin	CWA	N	$4.50	**	2y10m	9/1/2007	7/1/2010
Mosinee	WI	Central Wisconsin	CWA	N	$4.50	$3,529,500	5y9m	7/1/2010	4/1/2016

Rhinelander	WI	Rhinelander-Oneida County	RHI	N	$3.00	$204,771	2y2m	1/1/1994	4/1/1996
Rhinelander	WI	Rhinelander-Oneida County	RHI	N	$3.00	$493,832	5y3m	6/1/1996	9/1/2001
Rhinelander	WI	Rhinelander-Oneida County	RHI	N	$4.50	**	2y4m	9/1/2001	1/1/2004
Rhinelander	WI	Rhinelander-Oneida County	RHI	N	$4.50	$1,351,274	8y4m	1/1/2004	5/1/2012
Casper	WY	Natrona County International	CPR	N	$3.00	$1,629,582	7y7m	9/1/1993	4/1/2001
Casper	WY	Natrona County International	CPR	N	$4.50	**	2y2m	4/1/2001	6/1/2003
Casper	WY	Natrona County International	CPR	N	$4.50	$2,590,000	8y5m	6/1/2003	11/1/2011
Cheyenne	WY	Cheyenne Regional/Jerry Olson Field	CYS	N	$3.00	$957,013	7y5m	11/1/1993	4/1/2001
Cheyenne	WY	Cheyenne Regional/Jerry Olson Field	CYS	N	$4.50	**	5y8m	4/1/2001	1/1/2007
Cheyenne	WY	Cheyenne Regional/Jerry Olson Field	CYS	N	$4.50	$407,728	5y6m	1/1/2007	7/1/2012
Cody	WY	Yellowstone Regional	COD	N	$3.00	$413,037	3y11m	8/1/1997	7/1/2001
Cody	WY	Yellowstone Regional	COD	N	$4.50	**	8m	7/1/2001	3/1/2002
Cody	WY	Yellowstone Regional	COD	N	$4.50	$76,373	3y1m	3/1/2002	4/1/2005
Cody	WY	Yellowstone Regional	COD	N	$4.50	$697,934	7y4m	9/1/2005	1/1/2013
Gillette	WY	Gillette-Campbell County	GCC	N	$3.00	$369,132	8y3m	9/1/1993	12/1/2001
Gillette	WY	Gillette-Campbell County	GCC	N	$4.50	$162,537	2y6m	12/1/2001	6/1/2004
Gillette	WY	Gillette-Campbell County	GCC	N	$4.50	*	6m	1/1/2005	7/1/2005
Gillette	WY	Gillette-Campbell County	GCC	N	$4.50	$770,410	6y4m	7/1/2005	11/1/2011
Jackson	WY	Jackson Hole	JAC	N	$3.00	$3,799,325	7y8m	8/1/1993	4/1/2001
Jackson	WY	Jackson Hole	JAC	N	$4.50	**	1y4m	4/1/2001	8/1/2002
Jackson	WY	Jackson Hole	JAC	N	$4.50	$8,257,557	9y11m	8/1/2002	7/1/2012
Laramie	WY	Laramie Regional	LAR	N	$3.00	$126,457	4y2m	8/1/1996	10/1/2000
Laramie	WY	Laramie Regional	LAR	N	$3.00	*	9m	12/1/2000	8/1/2001
Laramie	WY	Laramie Regional	LAR	N	$4.50	$252,009	6y4m	12/1/2006	4/1/2013
Riverton	WY	Riverton Regional	RIW	N	$3.00	$1,055,040	5y11m	5/1/1995	4/1/2001
Riverton	WY	Riverton Regional	RIW	N	$4.50	**	22y6m	4/1/2001	10/1/2023
Rock Springs	WY	Rock Springs-Sweetwater County	RKS	N	$3.00	$382,300	11y	4/1/1995	4/1/2006
Rock Springs	WY	Rock Springs-Sweetwater County	RKS	N	$4.50	$476,907	6y5m	4/1/2006	9/1/2012
Sheridan	WY	Sheridan County	SHR	N	$3.00	$218,988	5y10m	3/1/1996	12/1/2001
Sheridan	WY	Sheridan County	SHR	N	$4.50	$433,610	6y9m	12/1/2001	9/1/2008
Sheridan	WY	Sheridan County	SHR	N	$4.50	$736,114	6y8m	10/1/2008	6/1/2015
Worland	WY	Worland Municipal	WRL	CS	$4.50	$70,500	5y2m	1/1/2003	3/1/2008
Worland	WY	Worland Municipal	WRL	CS	$4.50	$193,038	13y11m	8/1/2008	7/1/2022

NOTES:

Collections at locations noted by * in the amount column were prematurely stopped due to FAA processing errors.

** Amount shown on line immediately above the double asterisk is the total approved collections at this location at both the $3 and $4.50 levels.

Letter of Intent (LOI) Commitments By Fiscal Year

State	City	Airport Name	Hub Type	Discretionary 2010	Entitlement 2010
AK	Anchorage	Ted Stevens Anchorage International	M	4,000,000.00	1,957,000.00
CA	Sacramento	Sacramento International	M	7,500,000.00	2,182,000.00
CO	Denver	Denver International	L	7,000,000.00	0
FL	Miami	Miami International	L	8,540,000.00	0
FL	Orlando	Orlando International	L	0	0
GA	Atlanta	Hartsfield - Jackson Atlanta International	L	12,500,000.00	0
IA	Cedar Rapids	The Eastern Iowa	S	3,500,000.00	3,000,000.00
IL	Chicago	Chicago O'Hare International	L	20,000,000.00	6,500,000.00
IN	Gary	Gary/Chicago International	N	5,000,000.00	1,000,000.00
IN	Indianapolis	Indianapolis International	M	3,000,000.00	5,000,000.00
KY	Covington	Cincinnati/Northern Kentucky Internationa	L	2,000,000.00	0
LA	Baton Rouge	Baton Rouge Metropolitan, Ryan Field	S	3,500,000.00	3,400,000.00
MA	Boston	General Edward Lawrence Logan Internat	L	5,900,000.00	3,780,000.00
MD	Hagerstown	Hagerstown Regional-Richard A Henson F	-	850,000.00	150,000.00
MN	Minneapolis	Minneapolis-St Paul International/Wold-C	L	5,000,000.00	0
MO	St. Louis	Lambert-St Louis International	M	8,500,000.00	4,249,717.00
NC	Charlotte	Charlotte/Douglas International	L	12,000,000.00	8,500,000.00
NC	Greensboro	Piedmont Triad International	S	6,000,000.00	5,200,000.00
NY	New York	John F Kennedy International	L	14,800,000.00	0
OH	Cleveland	Cleveland-Hopkins International	M	13,170,000.00	3,099,000.00
OH	Columbus	Port Columbus International	M	0	0
PA	Harrisburg	Harrisburg International	S	0	0
SC	Myrtle Beach	Myrtle Beach International	S	0	0
TN	Memphis	Memphis International	M	4,823,000.00	0
TX	Dallas-Fort Worth	Dallas/Fort Worth International	L	6,000,000.00	0
TX	Houston	George Bush Intercontinental/Houston	L	13,050,000.00	10,024,000.00
UT	St. George	New	-	10,000,000.00	1,000,000.00
VA	Washington	Washington Dulles International	L	4,000,000.00	6,662,414.00
WA	Seattle	Seattle-Tacoma International	L	20,075,000.00	335,205.00

Letter of Intent (LOI) Commitments By Fiscal Year

State	City	Airport Name	Discretionary 2011	Entitlement 2011
AK	Anchorage	Ted Stevens Anchorage International	7,200,000.00	3,475,750.00
CA	Sacramento	Sacramento International	7,000,000.00	2,124,000.00
CO	Denver	Denver International	7,000,000.00	0
FL	Miami	Miami International	0	0
FL	Orlando	Orlando International	0	0
GA	Atlanta	Hartsfield - Jackson Atlanta International	10,000,000.00	0
IA	Cedar Rapids	The Eastern Iowa	2,500,000.00	0
IL	Chicago	Chicago O'Hare International	20,000,000.00	0
IN	Gary	Gary/Chicago International	5,000,000.00	1,000,000.00
IN	Indianapolis	Indianapolis International	5,000,000.00	5,000,000.00
KY	Covington	Cincinnati/Northern Kentucky International	6,000,000.00	0
LA	Baton Rouge	Baton Rouge Metropolitan, Ryan Field	2,500,000.00	3,400,000.00
MA	Boston	General Edward Lawrence Logan International	5,900,000.00	3,830,000.00
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	850,000.00	150,000.00
MN	Minneapolis	Minneapolis-St Paul International/Wold-Chamberlain	0	0
MO	St. Louis	Lambert-St Louis International	0	0
NC	Charlotte	Charlotte/Douglas International	12,000,000.00	8,500,000.00
NC	Greensboro	Piedmont Triad International	0	5,200,000.00
NY	New York	John F Kennedy International	10,900,000.00	0
OH	Cleveland	Cleveland-Hopkins International	0	3,165,000.00
OH	Columbus	Port Columbus International	0	0
PA	Harrisburg	Harrisburg International	0	0
SC	Myrtle Beach	Myrtle Beach International	0	0
TN	Memphis	Memphis International	0	0
TX	Dallas-Fort Worth	Dallas/Fort Worth International	0	0
TX	Houston	George Bush Intercontinental/Houston	0	0
UT	St. George	New	15,000,000.00	1,000,000.00
VA	Washington	Washington Dulles International	0	6,662,414.00
WA	Seattle	Seattle-Tacoma International	8,200,000.00	5,400,000.00

Letter of Intent (LOI) Commitments By Fiscal Year

State	City	Airport Name	Discretionary 2012	Entitlement 2012
AK	Anchorage	Ted Stevens Anchorage International	6,280,000.00	3,015,750.00
CA	Sacramento	Sacramento International	6,000,000.00	2,171,000.00
CO	Denver	Denver International	6,000,000.00	0
FL	Miami	Miami International	0	0
FL	Orlando	Orlando International	0	0
GA	Atlanta	Hartsfield - Jackson Atlanta International	0	0
IA	Cedar Rapids	The Eastern Iowa	1,500,000.00	0
IL	Chicago	Chicago O'Hare International	20,000,000.00	0
IN	Gary	Gary/Chicago International	5,000,000.00	1,000,000.00
IN	Indianapolis	Indianapolis International	0	0
KY	Covington	Cincinnati/Northern Kentucky International	0	0
LA	Baton Rouge	Baton Rouge Metropolitan, Ryan Field	3,000,000.00	3,400,000.00
MA	Boston	General Edward Lawrence Logan International	5,800,000.00	3,870,000.00
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	850,000.00	150,000.00
MN	Minneapolis	Minneapolis-St Paul International/Wold-Chamberlain	0	0
MO	St. Louis	Lambert-St Louis International	0	0
NC	Charlotte	Charlotte/Douglas International	12,000,000.00	8,500,000.00
NC	Greensboro	Piedmont Triad International	0	5,200,000.00
NY	New York	John F Kennedy International	14,800,000.00	0
OH	Cleveland	Cleveland-Hopkins International	0	3,233,000.00
OH	Columbus	Port Columbus International	0	0
PA	Harrisburg	Harrisburg International	0	0
SC	Myrtle Beach	Myrtle Beach International	0	0
TN	Memphis	Memphis International	0	0
TX	Dallas-Fort Worth	Dallas/Fort Worth International	0	0
TX	Houston	George Bush Intercontinental/Houston	0	0
UT	St. George	New	10,000,000.00	1,000,000.00
VA	Washington	Washington Dulles International	20,000,000.00	0
WA	Seattle	Seattle-Tacoma International	0	5,500,000.00

Letter of Intent (LOI) Commitments By Fiscal Year

State	City	Airport Name	Discretionary 2013	Entitlement 2013
AK	Anchorage	Ted Stevens Anchorage International	0	0
CA	Sacramento	Sacramento International	6,000,000.00	2,220,000.00
CO	Denver	Denver International	2,000,000.00	0
FL	Miami	Miami International	0	0
FL	Orlando	Orlando International	0	0
GA	Atlanta	Hartsfield - Jackson Atlanta International	0	0
IA	Cedar Rapids	The Eastern Iowa	0	0
IL	Chicago	Chicago O'Hare International	20,000,000.00	0
IN	Gary	Gary/Chicago International	5,000,000.00	1,000,000.00
IN	Indianapolis	Indianapolis International	0	0
KY	Covington	Cincinnati/Northern Kentucky International	0	0
LA	Baton Rouge	Baton Rouge Metropolitan, Ryan Field	0	0
MA	Boston	General Edward Lawrence Logan International	0	0
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	850,000.00	150,000.00
MN	Minneapolis	Minneapolis-St Paul International/Wold-Chamberlain	0	0
MO	St. Louis	Lambert-St Louis International	0	0
NC	Charlotte	Charlotte/Douglas International	12,000,000.00	0
NC	Greensboro	Piedmont Triad International	0	6,115,513.00
NY	New York	John F Kennedy International	11,800,000.00	0
OH	Cleveland	Cleveland-Hopkins International	0	3,304,000.00
OH	Columbus	Port Columbus International	0	0
PA	Harrisburg	Harrisburg International	0	0
SC	Myrtle Beach	Myrtle Beach International	0	0
TN	Memphis	Memphis International	0	0
TX	Dallas-Fort Worth	Dallas/Fort Worth International	0	0
TX	Houston	George Bush Intercontinental/Houston	0	0
UT	St. George	New	10,000,000.00	1,000,000.00
VA	Washington	Washington Dulles International	13,000,000.00	0
WA	Seattle	Seattle-Tacoma International	0	5,600,000.00

Letter of Intent (LOI) Commitments By Fiscal Year

State	City	Airport Name	Discretionary 2014	Entitlement 2014
AK	Anchorage	Ted Stevens Anchorage International	0	0
CA	Sacramento	Sacramento International	6,000,000.00	2,271,000.00
CO	Denver	Denver International	0	0
FL	Miami	Miami International	0	0
FL	Orlando	Orlando International	0	0
GA	Atlanta	Hartsfield - Jackson Atlanta International	0	0
IA	Cedar Rapids	The Eastern Iowa	0	0
IL	Chicago	Chicago O'Hare International	20,000,000.00	0
IN	Gary	Gary/Chicago International	5,000,000.00	1,000,000.00
IN	Indianapolis	Indianapolis International	0	0
KY	Covington	Cincinnati/Northern Kentucky International	0	0
LA	Baton Rouge	Baton Rouge Metropolitan, Ryan Field	0	0
MA	Boston	General Edward Lawrence Logan International	0	0
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	0	0
MN	Minneapolis	Minneapolis-St Paul International/Wold-Chamberlain	0	0
MO	St. Louis	Lambert-St Louis International	0	0
NC	Charlotte	Charlotte/Douglas International	6,000,000.00	0
NC	Greensboro	Piedmont Triad International	0	0
NY	New York	John F Kennedy International	10,900,000.00	0
OH	Cleveland	Cleveland-Hopkins International	0	3,378,000.00
OH	Columbus	Port Columbus International	0	0
PA	Harrisburg	Harrisburg International	0	0
SC	Myrtle Beach	Myrtle Beach International	0	0
TN	Memphis	Memphis International	0	0
TX	Dallas-Fort Worth	Dallas/Fort Worth International	0	0
TX	Houston	George Bush Intercontinental/Houston	0	0
UT	St. George	New	10,000,000.00	1,000,000.00
VA	Washington	Washington Dulles International	13,000,000.00	0
WA	Seattle	Seattle-Tacoma International	0	5,700,000.00

Letter of Intent (LOI) Commitments By Fiscal Year

State	City	Airport Name	Discretionary 2015	Entitlement 2015
AK	Anchorage	Ted Stevens Anchorage International	0	0
CA	Sacramento	Sacramento International	6,000,000.00	2,328,884.00
CO	Denver	Denver International	0	0
FL	Miami	Miami International	0	0
FL	Orlando	Orlando International	0	0
GA	Atlanta	Hartsfield - Jackson Atlanta International	0	0
IA	Cedar Rapids	The Eastern Iowa	0	0
IL	Chicago	Chicago O'Hare International	20,000,000.00	0
IN	Gary	Gary/Chicago International	2,844,597.00	1,000,000.00
IN	Indianapolis	Indianapolis International	0	0
KY	Covington	Cincinnati/Northern Kentucky International	0	0
LA	Baton Rouge	Baton Rouge Metropolitan, Ryan Field	0	0
MA	Boston	General Edward Lawrence Logan International	0	0
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	0	0
MN	Minneapolis	Minneapolis-St Paul International/Wold-Chamberlain	0	0
MO	St. Louis	Lambert-St Louis International	0	0
NC	Charlotte	Charlotte/Douglas International	0	0
NC	Greensboro	Piedmont Triad International	0	0
NY	New York	John F Kennedy International	7,000,000.00	0
OH	Cleveland	Cleveland-Hopkins International	0	3,455,000.00
OH	Columbus	Port Columbus International	0	0
PA	Harrisburg	Harrisburg International	0	0
SC	Myrtle Beach	Myrtle Beach International	0	0
TN	Memphis	Memphis International	0	0
TX	Dallas-Fort Worth	Dallas/Fort Worth International	0	0
TX	Houston	George Bush Intercontinental/Houston	0	0
UT	St. George	New	9,000,000.00	1,000,000.00
VA	Washington	Washington Dulles International	14,000,000.00	0
WA	Seattle	Seattle-Tacoma International	0	6,231,753.00

Letter of Intent (LOI) Commitments By Fiscal Year

State	City	Airport Name	Discretionary 2016	Entitlement 2016
AK	Anchorage	Ted Stevens Anchorage International	0	0
CA	Sacramento	Sacramento International	0	0
CO	Denver	Denver International	0	0
FL	Miami	Miami International	0	0
FL	Orlando	Orlando International	0	0
GA	Atlanta	Hartsfield - Jackson Atlanta International	0	0
IA	Cedar Rapids	The Eastern Iowa	0	0
IL	Chicago	Chicago O'Hare International	20,000,000.00	0
IN	Gary	Gary/Chicago International	0	0
IN	Indianapolis	Indianapolis International	0	0
KY	Covington	Cincinnati/Northern Kentucky International	0	0
LA	Baton Rouge	Baton Rouge Metropolitan, Ryan Field	0	0
MA	Boston	General Edward Lawrence Logan International	0	0
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	0	0
MN	Minneapolis	Minneapolis-St Paul International/Wold-Chamberlain	0	0
MO	St. Louis	Lambert-St Louis International	0	0
NC	Charlotte	Charlotte/Douglas International	0	0
NC	Greensboro	Piedmont Triad International	0	0
NY	New York	John F Kennedy International	7,000,000.00	0
OH	Cleveland	Cleveland-Hopkins International	0	3,535,000.00
OH	Columbus	Port Columbus International	0	0
PA	Harrisburg	Harrisburg International	0	0
SC	Myrtle Beach	Myrtle Beach International	0	0
TN	Memphis	Memphis International	0	0
TX	Dallas-Fort Worth	Dallas/Fort Worth International	0	0
TX	Houston	George Bush Intercontinental/Houston	0	0
UT	St. George	New	0	0
VA	Washington	Washington Dulles International	9,000,000.00	0
WA	Seattle	Seattle-Tacoma International	0	0

Letter of Intent (LOI) Commitments By Fiscal Year

State	City	Airport Name	Discretionary 2017	Entitlement 2017
AK	Anchorage	Ted Stevens Anchorage International	0	0
CA	Sacramento	Sacramento International	0	0
CO	Denver	Denver International	0	0
FL	Miami	Miami International	0	0
FL	Orlando	Orlando International	0	0
GA	Atlanta	Hartsfield - Jackson Atlanta International	0	0
IA	Cedar Rapids	The Eastern Iowa	0	0
IL	Chicago	Chicago O'Hare International	20,000,000.00	0
IN	Gary	Gary/Chicago International	0	0
IN	Indianapolis	Indianapolis International	0	0
KY	Covington	Cincinnati/Northern Kentucky International	0	0
LA	Baton Rouge	Baton Rouge Metropolitan, Ryan Field	0	0
MA	Boston	General Edward Lawrence Logan International	0	0
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	0	0
MN	Minneapolis	Minneapolis-St Paul International/Wold-Chamberlain	0	0
MO	St. Louis	Lambert-St Louis International	0	0
NC	Charlotte	Charlotte/Douglas International	0	0
NC	Greensboro	Piedmont Triad International	0	0
NY	New York	John F Kennedy International	0	0
OH	Cleveland	Cleveland-Hopkins International	0	658,991.00
OH	Columbus	Port Columbus International	0	0
PA	Harrisburg	Harrisburg International	0	0
SC	Myrtle Beach	Myrtle Beach International	0	0
TN	Memphis	Memphis International	0	0
TX	Dallas-Fort Worth	Dallas/Fort Worth International	0	0
TX	Houston	George Bush Intercontinental/Houston	0	0
UT	St. George	New	0	0
VA	Washington	Washington Dulles International	0	0
WA	Seattle	Seattle-Tacoma International	0	0

Letter of Intent (LOI) Commitments By Fiscal Year

State	City	Airport Name	Discretionary Beyond	Entitlement Beyond
AK	Anchorage	Ted Stevens Anchorage International	0	0
CA	Sacramento	Sacramento International	0	0
CO	Denver	Denver International	0	0
FL	Miami	Miami International	0	0
FL	Orlando	Orlando International	0	0
GA	Atlanta	Hartsfield - Jackson Atlanta International	0	0
IA	Cedar Rapids	The Eastern Iowa	0	0
IL	Chicago	Chicago O'Hare International	60,000,000.00	0
IN	Gary	Gary/Chicago International	0	0
IN	Indianapolis	Indianapolis International	0	0
KY	Covington	Cincinnati/Northern Kentucky International	0	0
LA	Baton Rouge	Baton Rouge Metropolitan, Ryan Field	0	0
MA	Boston	General Edward Lawrence Logan International	0	0
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	0	0
MN	Minneapolis	Minneapolis-St Paul International/Wold-Chamberlain	0	0
MO	St. Louis	Lambert-St Louis International	0	0
NC	Charlotte	Charlotte/Douglas International	0	0
NC	Greensboro	Piedmont Triad International	0	0
NY	New York	John F Kennedy International	0	0
OH	Cleveland	Cleveland-Hopkins International	0	0
OH	Columbus	Port Columbus International	0	0
PA	Harrisburg	Harrisburg International	0	0
SC	Myrtle Beach	Myrtle Beach International	0	0
TN	Memphis	Memphis International	0	0
TX	Dallas-Fort Worth	Dallas/Fort Worth International	0	0
TX	Houston	George Bush Intercontinental/Houston	0	0
UT	St. George	New	0	0
VA	Washington	Washington Dulles International	0	0
WA	Seattle	Seattle-Tacoma International	0	0

Letter of Intent (LOI) Commitments By Fiscal Year

State	City	Airport Name	Discretionary Total	Entitlement Total
AK	Anchorage	Ted Stevens Anchorage International	17,480,000.00	9,835,810.00
CA	Sacramento	Sacramento International	44,500,000.00	15,400,000.00
CO	Denver	Denver International	24,000,000.00	0
FL	Miami	Miami International	18,650,000.00	0
FL	Orlando	Orlando International	0	4,780,000.00
GA	Atlanta	Hartsfield - Jackson Atlanta International	46,208,300.00	0
IA	Cedar Rapids	The Eastern Iowa	11,800,000.00	6,414,250.00
IL	Chicago	Chicago O'Hare International	240,000,000.00	13,000,000.00
IN	Gary	Gary/Chicago International	32,844,597.00	7,000,000.00
IN	Indianapolis	Indianapolis International	13,000,000.00	15,000,000.00
KY	Covington	Cincinnati/Northern Kentucky International	14,000,000.00	0
LA	Baton Rouge	Baton Rouge Metropolitan, Ryan Field	13,000,000.00	13,600,000.00
MA	Boston	General Edward Lawrence Logan International	23,600,000.00	15,220,000.00
MD	Hagerstown	Hagerstown Regional-Richard A Henson Field	7,250,000.00	750,000.00
MN	Minneapolis	Minneapolis-St Paul International/Wold-Chamberlain	10,000,000.00	0
MO	St. Louis	Lambert-St Louis International	21,000,000.00	7,087,236.00
NC	Charlotte	Charlotte/Douglas International	65,000,000.00	34,000,000.00
NC	Greensboro	Piedmont Triad International	12,000,000.00	26,915,513.00
NY	New York	John F Kennedy International	89,100,000.00	0
OH	Cleveland	Cleveland-Hopkins International	29,650,000.00	26,863,991.00
OH	Columbus	Port Columbus International	0	0
PA	Harrisburg	Harrisburg International	2,170,000.00	0
SC	Myrtle Beach	Myrtle Beach International	0	0
TN	Memphis	Memphis International	10,003,000.00	0
TX	Dallas-Fort Worth	Dallas/Fort Worth International	11,292,000.00	0
TX	Houston	George Bush Intercontinental/Houston	25,800,000.00	20,024,000.00
UT	St. George	New	73,000,000.00	7,000,000.00
VA	Washington	Washington Dulles International	93,000,000.00	19,987,242.00
WA	Seattle	Seattle-Tacoma International	41,975,000.00	33,979,570.00

FACILITIES AND EQUIPMENT, RECOVERY ACT

Program and Financing
(in millions of dollars)

Identification code: 69-1304-0		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Obligations by program activity:			
	Direct program:			
00.01	Power systems	.....	50	.....
00.02	Modernize aging en route air traffic control centers	.....	50	.....
00.03	Replace air traffic control towers (ATCT/TRACONS)	.....	20	60
00.04	Install airport lighting, navigation and landing equipment	.....	20	.....
09.01	Reimbursable program	.....	.....	.....
10.00	Total new obligations	.....	140	60
	Budgetary resources available for obligation:			
21.40	Unobligated balance carried forward, start of year	.....	.....	60
22.00	New budget authority (gross)	.....	200	.....
22.23	Expired unobligated balance transfer to unexpired account	.....	.....	.....
23.90	Total budgetary resources available for obligation	.....	200	60
23.95	Total new obligations	.....	-140	-60
23.98	Unobligated balance expiring or withdrawn	.....	.....	.....
24.40	Unobligated balance carried forward, end of year	.....	60	.....
	New budget authority (gross), detail:			
	Discretionary:			
40.01	Appropriation (Recovery Act)	.....	200	.....
	Change in obligated balances:			
72.40	Obligated balance, start of year:	.....	.....	60
73.10	Total new obligations	.....	140	60
73.20	Total outlays (gross)	.....	-80	-79
74.00	Change in uncollected customer payment for Federal sources (unexpired)	.....	.....	.....
74.10	Change in uncollected customer payment for Federal sources (expired)	.....	.....	.....
74.40	Obligated balance, end of year	.....	60	41
	Outlays (gross), detail:			
86.90	Outlays from new discretionary authority	.....	80	.....
86.93	Outlays from discretionary balances	.....	.....	79
86.98	Outlays from mandatory balances	.....	.....	.....
87.00	Total outlays (gross)	.....	80	79
	Net budget authority and outlays			
89.00	Budget authority	.....	200	.....
90.00	Outlays	.....	80	79

The American Recovery and Reinvestment Act of 2009 provided $200 million to FAA's Facilities & Equipment (F&E) account, which finances major capital investments related to modernizing and improving air traffic control and airway facilities, equipment, and systems. Funds were appropriated from the General Fund of the U.S. Treasury and available for obligation through FY 2010. The funding is being used to upgrade, modernize, and improve FAA power systems, air route traffic control centers, air traffic control towers, terminal radar approach control facilities, and navigation and landing equipment.

Object Classification
(in millions of dollars)

Identification code: 69-1304-0		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Direct obligations:			
12.52	Other services	. . . . .	84	36
13.10	Equipment	. . . . .	56	24
99.99	Total new obligations	. . . . .	140	60

GRANTS-IN-AID FOR AIRPORTS, RECOVERY ACT

Program and Financing
(in millions of dollars)

Identification code: 69-1306-0		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Obligations by program activity:			
	Direct Program:			
00.01	Grants-in-aid for airports		1,098	
00.02	Administrative Oversight		2	
10.00	Total new obligations		1,100	
	Budgetary resources available for obligation:			
22.00	New budget authority (gross)		1,100	
23.95	Total new obligations		-1,100	
	New budget authority (gross), detail:			
	Discretionary:			
40.01	Appropriation (Recovery Act)		1,100	
	Change in obligated balances:			
72.40	Obligated balance, start of year			990
73.10	Total new obligations		1,100	
73.20	Total outlays (gross)		-110	-660
74.40	Obligated balance, end of year		990	330
	Outlays (gross), detail:			
86.90	Outlays from new discretionary authority		110	
86.93	Outlays from discretionary balances			660
87.00	Total outlays (gross)		110	660
	Net budget authority and outlays:			
89.00	Budget authority		1,100	
90.00	Outlays		110	660

The American Recovery and Reinvestment Act of 2009 provided $1.1 billion for Grants-in-Aid for Airports (AIP). Funds are appropriated from the General Fund of the U.S. Treasury and are available for obligation through FY 2010. These funds are being allocated to qualified airports as discretionary grants, and will be distributed based on a project priority system that addresses airport safety and security, infrastructure, runway safety, increased capacity, and mitigation of environmental impacts.

Object Classification
(in millions of dollars)

Identification code: 69-1306-0		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Direct obligations:			
	Personnel compensation			
11.5	Other personnel compensation		2	
14.10	Grants, subsidies, and contributions		1,098	
99.9	Total new obligations		1,100	

AVIATION USER FEES

Special and Trust Fund Receipts
(in millions of dollars)

Identification code: 69-5422-0-2-402		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Balance, start of year:			
01.00	Balance, start of year	....	....	27
01.99	Balance Start of year	....	....	27
	Receipts:			
02.00	Aviation user fees, over flight fees	53	55	56
04.00	Total balances and collections	53	55	83
	Appropriations:			
05.00	Aviation user fees	-53	-28	-50
07.99	Balance, end of year	....	27	33

Program and Financing
(in millions of dollars)

Identification code: 69-5422-0-2-402		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Budget resources available for obligation:			
21.40	Un-obligated balance carried forward, start of year	11	22	....
22.00	New budget authority (gross)	11	....	....
22.21	Unobligated balance transferred to other accounts (69-5423)	....	-22	
23.90	Total budgetary resources available for obligation	22	....	....
24.40	Un-obligated balance carried forward, end of year	22	....	....
	New budget authority (gross), detail:			
	Mandatory:			
60.20	Appropriations (special fund)	53	28	50
61.00	Transferred to other accounts	-42	-28	-50
62.50	Appropriation (total mandatory)	11	....	....
	Net budget authority and outlays:			
89.00	Budget authority	11	....	....
90.00	Outlays	....	....	....

The Federal Aviation Reauthorization Act of 1996 (P.L. 104-264) authorized the collection of user fees for air traffic control and related services provided by the FAA to aircraft that neither take off nor land in the United States, commonly known as over-flight fees. The Budget estimates that $56 million in over-flight fees will be collected in 2010.

AVIATION INSURANCE REVOLVING FUND

Program and Financing
(in millions of dollars)

Identification code: 69-4120-0-3-402		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Obligations by program activity:			
09.01	Program administration	2	11	1
10.00	Total new obligations(object class 25.2)	2	11	1
	Budget resources available for obligation:			
21.40	Unobligated balance carried forward, start of year	939	1,137	1,310
22.00	New budget authority (gross)	200	184	193
23.90	Total budgetary resources available for obligation	1,139	1,321	1,503
23.95	Total new obligations	-2	-11	-1
24.40	Unobligated balance carried forward, end of year	1,137	1,310	1,502
	New budget authority (gross), detail:			
	Mandatory:			
69.00	Spending authority from offsetting collections: Offsetting collections (cash)	200	184	193
	Change in obligated balances:			
72.40	Obligated balance, start of year	9	5	5
73.10	Total new obligations	2	11	1
73.20	Total outlays (gross)	-6	-11	-1
74.40	Obligated balance, end of year	5	5	5
	Outlays (gross), detail:			
86.97	Outlays from new mandatory authority	6	11	1
	Offsets:			
	Against gross budget authority and outlays:			
	Offsetting collections (cash) from:			
88.20	Interest on Federal securities	30	30	35
88.40	Non-Federal sources	170	154	158
88.90	Total, offsetting collections (cash)	200	184	193
	Net budget authority and outlays:			
89.00	Budget authority	....	....	....
90.00	Outlays	-194	-173	-192
	Memorandum (non-add) entries:			
92.01	Total investments, start of year: Federal securities: Par value	888	1,078	1,302
92.02	Total investments, end of year: Federal securities: Par value	1,078	1,302	1,490

The fund provides direct support for the aviation insurance program (chapter 443 of title 49, U.S. Code). Income to the fund is derived from premium collections for premium insurance coverage issued, income from authorized investments, and binder fees for non premium coverage issued. The binders provide aviation insurance coverage for U.S. air carrier aircraft used in connection with certain Government contract operations by the Department of Defense and the Department of State.

The Homeland Security Act of 2002 (P.L. 107-296) required the Secretary to provide additional war risk insurance coverage (Hull Loss and Passenger and Crew Liability) to air carriers insured for Third-Party War Risk Liability as of June 19, 2002, as authorized under existing law. Continuation of this coverage was subsequently directed by several appropriations acts, the last being the Federal Aviation Administration Extension Act of 2009, which extended the requirement to provide insurance coverage through September 30, 2009. The Budget contains no policy recommendation for the aviation insurance program and displays baseline funding for the program in 2010.

The Secretary is authorized to limit an air carrier's third party liability to $100 million, when the Secretary certifies that the loss was from an act of terrorism. The FAA insurance policy covers: (i) hull losses at agreed value; (ii) death, injury, or property loss to passengers or crew, the limit being the same as that of the air carrier's commercial coverage before September 11, 2001; and (iii) third party liability, the limit generally being twice that of such coverage.

Object Classification
(in millions of dollars)

Identification code: 69-4120-0-3-402		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Reimbursable obligations:			
21.11	Personnel Compensation: Full time permanent	1	1	1
24.20	Insurance claims and indemnities	....	5	....
24.40	Refunds	1	5	....
29.90	Subtotal, Obligations, Reimbursable Obligations	2	11	1
99.99	Total new obligations	2	11	1

Employment Summary

Identification code: 69-4120-0-3-402		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Reimbursable:			
20.01	Civilian Full-time equivalent employment	5	5	5

ADMINISTRATIVE SERVICES FRANCHISE FUND

Program and Financing
(in millions of dollars)

Identification code: 69-4562-0-4-402		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Obligations by program activity:			
09.01	Accounting Services	46	46	46
09.02	Travel	2	......	......
09.04	Information Services	94	94	97
09.05	Duplicating Services	6	5	5
09.06	Multi Media	3	3	3
09.07	CMEL/Training	9	12	13
09.08	International Training	3	3	3
09.10	Logistics	200	215	213
09.11	Aircraft Maintenance	52	53	54
09.99	Total reimbursable program	415	431	434
10.00	Total new obligations	415	431	434
	Budget resources available for obligation:			
21.40	Un-obligated balance carried forward, start of year	163	194	133
22.00	New budget authority (gross)	403	370	340
22.10	Resources available from recoveries of prior year Obligations	43	....	....
23.90	Total budgetary resources available for obligation	609	564	473
23.95	Total new obligations	-415	-431	-434
24.40	Un-obligated balance carried forward, end of year	194	133	39
	New budget authority (gross), detail:			
	Discretionary:			
	Spending authority from offsetting collections:			
58:00	Offsetting collections (cash)	368	370	340
58.10	Change in uncollected customer payments from federal sources (unexpired)	35	....	....
58:90	Spending authority from offsetting collections (total discretionary)	403	370	340
	Change in obligated balances:			
72.40	Obligated balance, start of year	104	62	114
73.10	Total new obligations	415	431	434
73.20	Total outlays (gross)	-379	-379	-434
73.45	Recoveries of prior year obligations	-43	....	....
74.00	Change in uncollected customer payments from federal sources (unexpired)	-35	....	....
74.40	Obligated balance, end of year	62	114	114
	Outlays (gross), detail:			
86.90	Outlays from new discretionary authority	296	252	231
86.93	Outlays from Discretionary balances	83	127	203
87.00	Total Outlays (gross)	379	379	434
	Offsets:			
	Against gross budget authority and outlays:			
88.00	Offsetting collections (cash) from: Federal Sources	368	370	340
	Against gross budget authority only:			
88.95	Change in uncollected customer payments from Federal Sources (unexpired)	35	....	....
	Net budget authority and outlays:			
89.00	Budget authority	....	....	....
90.00	Outlays	11	9	94

In 1997, the Federal Aviation Administration established a franchise fund to finance operations where the costs for goods and services provided are charged to the users on a reimbursable basis. The fund improves organizational efficiency and provides better support to FAA's internal and external customers. The activities included in this franchise fund are: training, accounting, payroll, travel, duplicating services, multi-media services, information technology, material management (logistics), and aircraft maintenance.

Object Classification
(in millions of dollars)

Identification code: 69-4562-0-4-402		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Reimbursable obligations:			
21.11	Personnel compensation: Full-time permanent	100	107	117
21.21	Civilian personnel benefits	27	29	32
22.10	Travel and transportation of persons	5	5	5
22.20	Transportation of things	5	5	5
22.33	Communications, utilities, and miscellaneous charges	13	13	14
22.40	Printing and reproduction	2	1	1
22.52	Other services	174	165	162
22.60	Supplies and materials	62	69	65
23.10	Equipment	27	37	33
29.90	Subtotal, Obligations, Reimbursable obligations	415	431	434
99.99	Total new obligations	415	431	434

Employment Summary

Identification code: 69-4562-0-4-402		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Reimbursable:			
2001	Civilian full-time equivalent employment	1,354	1,380	1,452

AIRPORT AND AIRWAY TRUST FUND

Program and Financing
(in millions of dollars)

Identification code: 20-8103-0-7-402		FY2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Memorandum (non-add) entries:			
92.01	Total investments, start of year: Federal securities: Par value	7,931	7,674	7,520
92.02	Total investments, end of year: Federal securities: Par value	7,674	7,520	6,919

Section 9502 of Title 26, U.S. Code, provides for amounts equivalent to the funds received in the Treasury for the passenger ticket tax and certain other taxes paid by airport and airway users to be transferred to the Airport and Airway Trust Fund. In turn, appropriations are authorized from this fund to meet obligations for airport improvement grants, FAA facilities and equipment, research, operations, payment to air carriers, and for the Bureau of Transportation Statistics Office of Airline Information.

The status of the fund is as follows:

Status of Funds
(in millions of dollars)

Identification code: 20-8103-0-7-402		FY2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Unexpended balance, start of year:			
01.00	Balance, start of year	10,103	9,705	9,510
	Adjustments:			
01.91	Adjustments	....	....	....
01.99	Total balance, start of year	10,103	9,705	9,510
	Cash Income during the year:			
	Current law:			
	Receipts			
12.00	Excise Taxes, Airport and Airway Trust Fund [021-00-810310-0]	11,992	11,282	11,697
	Offsetting receipts (intragovernmental):			
12.40	Interest, Airport and Airway Trust Fund	433	256	264
12.41	Interest, Airport and Airway Trust Fund	....	....	-10
	Offsetting collections:			
12.80	Payments to Air Carriers	....	4	
12.81	Grants-in-aid for Airports (Airport and Airway Trust Fund)	11	16	14
12.82	Facilities and Equipment (Airport and Airway Trust Fund)	32	47	47
12.83	Facilities and Equipment (Airport and Airway Trust Fund)	70	93	93
12.84	Research, Engineering and Development (Airport and Airway Trust Fund)	1	16	16
12.99	Income under present law	12,539	11,714	12,121
32.99	Total cash income	12,539	11,714	12,121
	Cash outgo during year:			
	Current law:			
45.00	Payments to air carriers	-41	-76	-104
45.01	Grants-in-aid for airports (Airport and Airway Trust Fund)	-3,819	-3,514	-3,510
45.02	Facilities and Equipment (Airport and Airway Trust Fund)	-2,560	-2,900	-2,854
45.03	Research, Engineering and Development (Airport and Airway Trust Fund)	-120	-181	-204
45.04	Trust Fund Share of FAA Activities (Airport and Airway Trust Fund)	-6,397	-5,238	-6,208
45.99	Outgo under current law (-)	-12,937	-11,909	-12,880
65.99	Total Cash outgo (-)	-12,937	-11,909	-12,880
	Unexpended balance, end of year:			
87.00	Uninvested balance (net), end of year	2,031	1,990	1,832
87.01	Airport and Airway Trust Fund	7,674	7,520	6,919
87.99	Total balance, end of year	9,705	9,510	8,751
	Commitments against unexpended balance, end of year:			
98.99	Total commitments (-)	-8,270	-8,582	-8,417
99.00	Uncommitted balance, end of year	1,435	928	334

TRUST FUND SHARE OF FAA ACTIVITIES
(AIRPORT AND AIRWAY TRUST FUND)

Program and Financing
(in millions of dollars)

	Identification code: 69-8104-0-7-402	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Obligations by program activity:			
00.01	Payment to operations	6,397	5,238	6,208
10.00	Total new obligations	6,397	5,238	6,208
	Budgetary resources available for obligation:			
22.00	New budget authority (gross)	6,397	5,238	6,208
23.95	Total new obligations	-6,397	-5,238	-6,208
	New budget authority (gross), detail:			
	Discretionary:			
40.26	Appropriation (Trust Fund)	6,397	5,238	6,208
	Change in obligated balances:			
72.40	Obligated balance, start of year	2	....	....
73.10	Total new obligations	6,397	5,238	6,208
73.20	Total outlays (gross)	-6,397	-5,238	-6,208
73.40	Adjustments in expired accounts (net)	-2		
74.40	Obligated balance, start of year	....	....	....
	Outlays (gross), detail:			
86.90	Outlays from new discretionary authority	6,397	5,238	6,208
87.00	Total outlays (gross)	6,397	5,238	6,208
	Net budget authority and outlays:			
89.00	Budget authority	6,397	5,238	6,208
90.00	Outlays	6,397	5,238	6,208

For 2010, the Budget proposes $9,336 million for FAA Operations, of which $6,208 million would be provided from the Airport and Airway Trust Fund.

Administrative Provisions—Federal Aviation Administration

Proposed Language	Justification
Sec. 110. The Administrator of the Federal Aviation Administration may reimburse amounts made available to satisfy 49 U.S.C. 41742(a)(1) from fees credited under 49 U.S.C. 45303: Provided, That during fiscal year 2009, 49 U.S.C. 41742(b) shall not apply, and any amount remaining in such account at the close of that fiscal year may be made available to satisfy section 41742(a)(1) for the subsequent fiscal year.	In order to satisfy 49 U.S.C. 41742(a)(1), at the beginning of each fiscal year FAA makes available to the Essential Air Services (EAS) program $50 million from the Facilities & Equipment (F&E) account. This provision allows FAA to reimburse F&E from the overflight fees collected and is needed in order to continue the practice in FY 2010.
Sec. 111. Amounts collected under section 40113(e) of title 49, United States Code, shall be credited to the appropriation current at the time of collection, to be merged with and available for the same purposes of such appropriation.	As authorized under 49 USC 40113(e), the FAA may provide safety-related training and operational services to foreign aviation authorities with or without reimbursement. While FAA generally enforces a prepayment policy for reimbursable goods and services provided to foreign countries or international organizations, many have laws or regulations similar to the U.S. that prohibit advance payments. In those instances, FAA often receives payments for services provided during a fiscal year after that year has ended. This provision allows FAA to use the funds for additional technical assistance work that cannot be prepaid, instead of returning the funds to a lapsed appropriation.
Sec. 112. None of the funds limited by this Act for grants under the Airport Improvement Program shall be made available to the sponsor of a commercial service airport if such sponsor fails to agree to a request from the Secretary of Transportation for cost-free space in a non-revenue producing, public use area of the airport terminal or other airport facilities for the purpose of carrying out a public service air passenger rights and consumer outreach campaign.	This provision requires airports to make space available, at the request of the Secretary, in the public use areas of a terminal (both non-revenue and revenue-producing areas) for an air passenger rights and consumer outreach campaign. The space includes areas that are currently leased to airline tenants.
Sec. 113. None of the funds in this Act shall be available for paying premium pay under 5 U.S.C. 5546(a) to any Federal Aviation Administration employee unless such employee actually performed work during the time corresponding to such premium pay.	This provision has historically been included in the appropriations language under the Operations account heading. The provision stems from past legal action taken by air traffic controllers to receive premium pay for a full shift, even if only part of the shift was eligible for premium pay. The FAA recommends including this provision as a GP that would apply to all FAA accounts. FAA also recommends keeping this provision for FY 2010 in order to minimize potential payroll liability.
Sec. 114. None of the funds in this Act may be obligated or expended for an employee of the Federal Aviation Administration to purchase a store gift card or gift certificate through use of a Government-issued credit card.	This provision prohibits FAA employees from using a government-issued credit card to purchase a store gift card or gift certificate. This provision has historically been included in the appropriations language under the Operations account heading. FAA recommends including this provision as a GP that would apply to all FAA accounts.

FEDERAL AVIATION ADMINISTRATION

OPERATIONS

ESTIMATES		APPROPRIATIONS	
2000	[1] 6,039,000,000	2000	[2] [3] 5,957,590,000
2001	[4] 6,592,235,000	2001	[5] [6] 6,515,837,683
		2001	[7] 123,000,000
2002	[8] 6,886,000,000	2002	[9] 6,886,000,000
		2002	[10] 200,000,000
		2002 Rescission	[11] -5,681,000
2003	[12] [13] 7,481,970,000	2003	[14] [15] [16] 7,019,170,377
2004	[17] 7,590,648,000	2004	[18] [19] 7,479,206,153
2005	[20] 7,849,000,000	2005	[21] [22] 7,706,537,000
2006	[23] [24] 8,201,000,000	2006	[26] [27] 8,104,140,000
2007	[25] 8,366,000,000	2007	[28] 8,374,374,217
2008	[29] 8,725,783,000	2008	[32] 8,740,000,000
2009	[30] 8,998,461,700	2009	[33] 9,042,467,000
2010	[31] 9,335,798,000		

[1] Administration proposed 100 percent funding from the Airport and Airway Trust Fund.
[2] Reflects rescission of $10,800,000 of Y2K balances per P.L. 106-246 and a reduction of $6,610,000 for TASC per P.L. 106-69.
[3] Includes $75,000,000 supplemental per P.L. 106-246.
[4] Administration proposed 100 percent funding from the Airport and Airway Trust Fund.
[5] Reflects administrative rescission of .22 percent per P.L. 106-554 and $14,000,000 transfer to the Essential Air Service.
[6] Includes $4,405,156,288 from the Airport and Airway Trust Fund.
[7] P.L. 107-38, Emergency Supplemental Appropriations Act for Recovery from and Response to Terrorist Attacks on the U.S., FY 2001.
[8] Includes $5,777,219,000 from the Airport and Airway Trust Fund.
[9] Includes $5,773,519,000 from the Airport and Airway Trust Fund.
[10] Emergency Supplemental Funding included in P.L. 107-117, FY 2002 Department of Defense Appropriations Bill.
[11] Reflects Administrative and Travel Rescission per P.L. 107-206;$5,542,000 from General Fund and $139,000 from Trust.
[12] FY 2003 includes $404,768,000 for CSRS/Health benefit accruals proposed by the Administration.
[13] Includes 3,799,278,000 from Airport and Airway Trust Fund.
[14] Includes $3,774,582,693 from Airport and Airway Trust Fund and $3,248,064,934 from General Fund.
[15] Reflects 0.65 percent across-the-board rescission per P.L. 108-7 and Working Capital Fund cut of $3.9M.
[16] Excludes Midway Island Airfield earmark for $3,500,000—reduced to $3,477,250 by 0.65 rescission.
[17] Administration proposes $6,000,000,000 from Airport and Airway Trust Fund.
[18] Reflects 0.59 percent across-the-board rescission per P.L. 108-199; Working Capital Fund cut by $7.3M.
[19] Includes $4,469,000,000 from Airport Airway Trust Fund.
[20] Includes $6,002,000,000 from Airport and Airway Trust Fund with $2M for Bureau of Transportation Statistics.
[21] Reflects 0.80 percent across-the-board rescission per P.L. 108-447 and Working Capital Fund cut of $6.3M.
[22] Includes $$4,878,728,416 from Airport and Airway Trust Fund.
[23] Includes $6,500,000,000 from the Airport and Airway Trust Fund.
[24] Includes $150,000,000 for Flight Service Station A-76 Competition.
[25] Includes $5,445,000,000 from Airport and Airway Trust Fund.
[26] Reflects 1.0 percent across-the-board rescission per P.L. 109-148.
[27] Includes $5,541,000,000 from Airport and Airway Trust Fund.
[28] Includes $5,627,900,000 from Airport and Airway Trust Fund
[29] Includes $6,243,027,000 from Airport and Airway Trust Fund. FAA did not request funding for this account in FY 2008. Funding was requested in the proposed Safety and Operations and Air Traffic Organization accounts. The Operations amount is shown here for comparative purposes.
[30] Includes $6,280,973,000 from Airport and Airway Trust Fund. FAA did not request funding for this account in FY 2009. Funding was requested in the proposed Safety and Operations and Air Traffic Organization accounts. The Operations amount is shown here for comparative purposes.
[31] Includes $6,207,798,000 from Airport and Airway Trust Fund.
[32] Includes $6,397,061,000 from Airport and Airway Trust Fund.
[33] Includes $5,238,005,000 from Airport and Airway Trust Fund.

FEDERAL AVIATION ADMINISTRATION

FACILITIES AND EQUIPMENT (AIRPORT AND AIRWAY TRUST FUND)

ESTIMATES

2000	2,319,000,000
2001	2,495,000,000
2002	2,914,000,000
2003	[39] 2,981,022,000
2004	2,916,000,000
2005	2,500,000,000
2006	2,448,000,000
2007	2,503,000,000
2008	[48] 2,461,566,000
2009	[49] 2,723,510,000
2010	2,925,202,000

APPROPRIATIONS

2000	[34] 2,034,427,000
2001	[35] 2,650,920,117
2002	2,914,000,000
2002	[36] -15,000,000
2002	[37] 108,500,000
2002 Rescission	[38] -1,726,000
2003	[40] 2,961,645,357
2003 Rescission	[41] -20,000,000
2004	[42] 2,892,831,000
2004 Rescission	[43] -30,000,000
2005	[44] 2,519,680,000
2005 Supplemental (P.L.108-324)	[45] 5,100,000
2006	[46] 2,514,600,000
2006	[47] 40,600,000
2007	2,517,520,000
2008	2,513,611,000
2009	2,742,095,000
2009 Supplemental (P.L.111-5)	[50] 200,000,000

[34] Reflects $30,000,000 rescission of unobligated balances per P.L. 106-69 and a $10,573,000 rescission of Y2K balances per P.L. 106-246.
[35] Includes administrative rescission of .22 percent per P.L. 106-554.
[36] Rescission of unobligated balances per P.L. 107-87.
[37] Emergency Supplemental Funding included in P.L. 107-117, FY 2002 Department of Defense Appropriations Bill.
[38] Administrative and Travel rescission per P.L. 107-206.
[39] FY 2003 request excludes $18,551,000 for CSRS/Health benefit accruals proposed by the Administration.
[40] Reflects 0.65 percent across-the-board rescission of per P.L. 108-7.
[41] Rescission of unobligated balances.
[42] Reflects 0.59 percent across-the–board rescission per P.L. 108-199.
[43] Rescission of unobligated balances.
[44] Reflects 0.80 percent across-the-board rescission per P.L. 108-447.
[45] American Recovery and Reinvestment Act Supplemental per P.L. 111-5, from the General Fund.
[46] Reflects 1.0 percent across-the-board rescission, per P. L. 109-148.
[47] Hurricane Supplemental fund per P.L. 109-148
[48] FAA did not request funding for this account in FY 2008. Funding was requested in the proposed Safety and Operations and Air Traffic Organization accounts. The Facilities and Equipment amount is shown here for comparative purposes.
[49] FAA did not request funding for this account in FY 2009. Funding was requested in the proposed Safety and Operations and Air Traffic Organization accounts. The Facilities amount is shown here for comparative purposes.
[50] American Recovery and Reinvestment Act Supplemental per P.L. 111-5, from the General Fund.

FEDERAL AVIATION ADMINISTRATION

RESEARCH, ENGINEERING, AND DEVELOPMENT

ESTIMATES		APPROPRIATIONS	
2000	173,000,000	2000	156,495,000
2001	184,366,000	2001	[51] 186,588,600
2002	187,781,000	2002	195,000,000
		2002	[52] 50,000,000
		2002 Rescission	[53] -161,000
2003	126,744,000	2003	[54] 147,485,075
2004	100,000,000	2004	[55] 118,734,310
2005	117,000,000	2005	[56] 129,879,584
2006	130,000,000	2006	[57] 136,620,000
2007	130,000,000	2007	130,234,000
2008	[58] 140,000,000	2008	146,828,000
2009	[59] 171,028,000	2009	171,000,000
2010	180,000,000		

[51] Includes rescission of .22 percent per P.L. 106-554.
[52] Emergency Supplemental Funding included in P.L. 107-117, FY 2002 Department of Defense Appropriations Bill.
[53] Administrative and Travel rescission per P.L. 107-206.
[54] Reflects a 0.65 percent across-the-board rescission per P.L. 108-7.
[55] Reflects a 0.59 percent across-the-board rescission per P.L. 108-199.
[56] Reflects a 0.80 percent across-the-board rescission per P.L. 108-447.
[57] Reflects a 1.0 percent across-the-board rescission of 1.0 percent per P.L. 109-148.
[58] Includes $122,867,000 from the Airport and Airway Trust Fund.
[59] Includes $156,003,000 from the Airport and Airway Trust Fund.

FEDERAL AVIATION ADMINISTRATION

GRANTS-IN-AID FOR AIRPORTS
(LIQUIDATION OF CONTRACT AUTHORIZATION)
(AIRPORT AND AIRWAY TRUST FUND)

ESTIMATES		APPROPRIATIONS	
2000	1,750,000,000	2000	1,750,000,000
2001	1,960,000,000	2001	3,200,000,000
		2001 Rescission	-579,000,000
2002	1,800,000,000	2002	1,800,000,000
2002 Rescission	-331,000,000	2002 Rescission	[60] -301,720,000
		2002	[61] 175,000,000
2003	3,100,000,000	2003	3,100,000,000
2004	3,400,000,000	2004	3,400,000,000
2005	2,800,000,000	2005	2,800,000,000
2006	3,300,000,000	2006	3,399,000,000
2007	4,000,000,000	2007	4,399,000,000
2008	4,300,000,000	2008	4,399,000,000
2009	3,600,000,000	2009	3,600,000,000
2010	3,000,000,000	2009 ... Supplemental (P.L. 111-5)	[62] 1,100,000,000

[60] Rescission of Contract Authority per P.L. 107-87.
[61] Emergency Supplemental Funding included in P.L. 107-117, FY 2002 Department of Defense Appropriations Bill.
[62] American Recovery and Reinvestment Act Supplemental, per P.L. 111-5, from the General Fund.

FEDERAL AVIATION ADMINISTRATION

GRANTS-IN-AID FOR AIRPORTS
LIMITATION ON OBLIGATIONS
(AIRPORT AND AIRWAY TRUST FUND)

ESTIMATES		APPROPRIATIONS	
2000	(1,600,000,000)	2000	[63] (1,895,638,000)
2001	(1,950,000,000)	2001	[64] [65] (3,195,454,500)
2001 (Proposed Supp.)	(-50,000,000)		
2002	(3,300,000,000)	2002	[66] (3,474,944,000)
2003	(3,400,000,000)	2003	[67] (3,377,900,000)
2004	(3,400,000,000)	2004	[68] (3,379,940,000)
		2004	[69] (1,988,200)
2005	(3,500,000,000)	2005	[70] (3,497,000,000)
2006	(3,000,000,000)	2006	(3,514,500,000)
2007	(2,750,000,000)	2007	(3,514,500,000)
2008	(2,750,000,000)	2008	(3,514,500,000)
2009	(2,750,000,000)	2009	(3,514,500,000)
2010	(3,515,000,000)		

[63] Reflects reduction of $54,362,000 per P.L. 106-113.
[64] Reflects administrative rescission of .22 percent per P.L. 106-554.
[65] Includes direct appropriation of $2,494,500 for Huntsville, Alabama, and reflect a .22 percent rescission pursuant to P.L. 106-554.
[66] Includes direct appropriation, DOD supplemental of $175,000,000 per P.L. 107-117 and reflects admin. rescission of $-56,000 per P.L. 107-206.
[67] Reflects 0.65 percent across-the-board rescission per P.L. 108-7.
[68] Reflects 0.59 percent across-the-board rescission per P.L. 108-199.
[69] Direct appropriation from General Fund for Ft. Worth Alliance Airport, pursuant to Division H, Section 167, P.L. 108-199.
[70] Includes 0.80 percent across-the-board rescission per P.L. 108-447 and includes a $25,000,000 Hurricane supplemental per P.L. 108-324.

Annual Performance Results and Targets

The Federal Aviation Administration (FAA) integrates performance results into its budget request to ensure alignment with the Department of Transportation's Strategic Plan. The FAA tracks the following DOT level performance measures to demonstrate program results:

Strategic Goal: Safety

Reducing Commercial Air Carrier Fatalities[1]: U.S. Fatalities per 100 Million Persons On Board						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	N/A	N/A	N/A	8.7	8.4	8.2
Actual	N/A	N/A	N/A	0.4[2]	N/A	N/A
Previous Measure: U.S. commercial air carrier fatal aviation accidents per 100,000 departures (last 3 years' average)						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	0.023	0.018	0.010	≤0.010	≤0.010	N/A
Actual	0.017	0.020	0.023[3]	0.023[2]	N/A	N/A

1 New metric replaces Fatal Accident Rate beginning in FY 2008. Through FY 2009, targets and results for both measures will be reported.
2 Preliminary estimate. Final data expected March 2010.
3 Actual result revised from preliminary estimate of 0.022 in FY 2009.

General Aviation Fatal Accident Rate[1]: Reduce the rate of fatal general aviation accidents						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	N/A	N/A	N/A	N/A	1.11	1.09
Actual	N/A	N/A	N/A	N/A	N/A	N/A
Previous Measure: Reduce the number of fatal general aviation accidents						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	343	337	331	325	319	N/A
Actual	354	301	313	299[2]	N/A	N/A

1 In FY 2009, metric changed to General Aviation Fatal Accident Rate.
2 Preliminary estimate. Final data expected March 2010.

Serious Hazardous Materials Incidents[1]: Number of serious hazardous materials transportation incidents (CY)						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	503	460	466	462	458	458
Actual	528	495	473	451[2]	N/A	N/A

1 Targets and results are for DOT as a whole; FAA contributes.
2 Preliminary estimate.

Commercial Space Launch Accidents[1]: Number of accidents resulting in fatalities, injuries, or significant property damage to uninvolved public						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	0	0	0	0	0	0
Actual	0	0	0	0	N/A	N/A

[1] FAA *Flight Plan* target. Although not designated a DOT-level measure, Commercial Space Launch Accidents is included to emphasize FAA's commitment to promoting safety in the rapidly developing commercial space industry.

Strategic Goal: Reduced Congestion

NAS On-Time Arrivals: Percent of all flights arriving within 15 minutes of schedule at the 35 Operational Evolution Plan airports due to National Air Space (NAS) related delays						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	87.40%	87.40%	87.67%	88.00%	88.00%	88.00%
Actual	88.44%	88.36%	86.96%	87.29%	N/A	N/A

Average Daily Airport Capacity: Average daily arrival and departure rates						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	99,892	101,191	101,562	101,868	100,707	102,648
Actual	101,463	101,932	102,545	103,222	N/A	N/A

Strategic Goal: Global Connectivity

International Aviation Development Projects[1]: The number of projects for which funding is arranged from the U.S. and international governmental organizations, multilateral banks, and industry.						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	N/A	N/A	N/A	N/A	7	7
Actual	N/A	N/A	N/A	N/A	N/A	N/A
Previous Measure: Yearly increase in international aviation development funding from the U.S. and international governmental organizations, multilateral banks, and industry						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	$14.36M	$23.41M	$12.00M	$15.00M	$18.00M	$21.00M
Actual	$19.51M	$33.04M	$13.36M	$16.70M	N/A	N/A

[1] Measure redefined in FY 2009 to show total projects per year for which funding is arranged.

NextGen Technologies: Total number of countries taking a significant step, as a result of FAA assistance and collaboration, to implement the operational use of NextGen technologies, procedures, or concepts						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	1	1	1	1	1	1
Actual	1	1	1	2	N/A	N/A

Strategic Goal: Environmental Stewardship

Noise Exposure: Percent reduction in the number of people in the U.S. who are exposed to significant aircraft noise levels						
	2005	**2006**	**2007**[2]	**2008**	**2009**	**2010**
Target	-3%	- 4%	- 8%	- 12%	- 16%	-20%
Actual	-35%[1]	-36%[1]	-37%[1]	-38%[3]	N/A	N/A

[1] Revised from original result due to improvement in noise exposure model in FY 2008.
[2] The target was revised in FY 2007 from a 1% annual decrease from the baseline to a 4% decrease, lowering the cumulative target for FY 2007 from 5% to 8%.
[3] Projection from trends, to be revised in May 2009.

Streamline Environmental Impact Statements[1]: Median time in months to complete Environmental Impact Statements (EIS) for DOT-funded infrastructure projects						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	N/A	N/A	N/A	60	54	48
Actual	56	57	67	63.5[2]	N/A	N/A

[1] Targets and results are for DOT as a whole; FAA contributes.
[2] Preliminary estimate.

DOT Facility Cleanup[1]: Percent of DOT facilities characterized as 'No Further Remedial Action Planned' under the Superfund Amendments Reauthorization Act						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	93%	93%	93%	93%	93%	93%
Actual	92%	92%	93%	94%	N/A	N/A

[1] Targets and results are for DOT as a whole; FAA contributes.

Strategic Goal: Organizational Excellence

Acquisition Schedule[1]: For major DOT aviation systems, percent of scheduled milestones established in the acquisition project baselines that are met						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	80.00%	85.00%	87.50%	90.00%	90.00%	90.00%
Actual	92.00%	97.44%	97.00%	93.88%	N/A	N/A

[1] This is designated as a DOT-level target, but only FAA results are measured.

Acquisition Cost[1]: For major DOT aviation systems, percent of cost goals established in the acquisition project baselines that are met						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	80.00%	85.00%	87.50%	90.00%	90.00%	90.00%
Actual	97.00%	100%	100%	96.08%	N/A	N/A

[1] This is designated as a DOT-level target, but only FAA results are measured.

Infrastructure Projects Schedule[1]: Percent of major Federally funded transportation infrastructure projects with less than 2 percent annual growth in the project completion milestone as reported in the finance plan						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	N/A	90.0%	90.0%	90.0%	90.0%	90.0%
Actual	89.0%	89.0%	89.0%	79.0%	N/A	N/A

[1] Targets and results are for DOT as a whole, to which FAA contributes.

Infrastructure Projects Cost[1]: Percent of finance plan cost estimates for Federally funded transportation infrastructure projects with less than 2 percent annual growth						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	N/A	90.0%	90.0%	90.0%	90.0%	90.0%
Actual	81.0%	84.0%	83.0%	82.0%	N/A	N/A

[1] Targets and results are for DOT as a whole, to which FAA contributes.

The FAA is Actively Addressing Management Challenges Identified in the FY 2009 Inspector General's Report

On November 17, 2008 the Department of Transportation's Office of Inspector General (OIG) reported on the Department's Top Management Challenges for FY 2009. The FAA and its stakeholders are addressing these challenges. In fact, policies to address many of these challenges have already been implemented. This section describes FAA's specific plans to address the Management Challenges applicable to the Department-wide report.

<table>
<tr><th colspan="2">MANAGEMENT CHALLENGE</th></tr>
<tr><td colspan="2">Enhancing Aviation Safety and Maintaining Confidence in FAA's Ability to Provide Effective Oversight of Rapidly Changing Industry</td></tr>
<tr><td>Issue:</td><td>Maintaining Confidence in FAA's Oversight of Air Carriers and Certification and Production of New Segments of the Aircraft Industry – (a) Enhancing Oversight of Air Carrier Operations

Airline consolidation and downsizing continue to dramatically change the industry, and widely publicized lapses in FAA oversight in 2008 emphasize the need for FAA to continually adapt its oversight to further enhance safety. A key challenge involves maintaining confidence in FAA's oversight of air carriers and following through on longstanding commitments to improve oversight of air carrier operations.</td></tr>
<tr><th colspan="2">ADDRESSING THE ISSUE</th></tr>
<tr><td>Specific steps to be taken in FY 2009</td><td>1. Provide quarterly reports to Congress on Air Transportation Oversight System (ATOS) inspections that exceed frequencies for completion
2. Develop Flight Standard Evaluation Program (FSEP) processes and checklists to determine periodically field office compliance with ATOS policy and procedures. Expected completion date by November 30, 2009.
3. Develop a risk-based process to target Air Carrier Evaluation Process (ACEP) teams to perform periodic reviews of air carrier compliance.
a. By March 31, 2009, develop a proposed risk-based scheduling process using criteria in FAA Order 8900.1, Volume 10, Chapter 4. The process will include a scoring system and thresholds for mandating evaluations.
b. By June 30, 2009, validate the process with regional and Certificate Holding District Office staff using actual data.
c. By September 30, 2009, determine personnel and resource requirements.
d. By October 31, 2009, present proposal for Flight Standards Service approval.
4. Develop a process for conducting periodic reviews of the effectiveness of ATOS design and performance using ACEP data.
a. By March 31, 2009, determine the need for supplemental checklists to gather anecdotal information from ACEP teams about the effectiveness of ATOS processes and tools.
b. By June 30, 2009, develop a process to perform a comparative analysis of ACEP findings and Certificate Management Team (CMT) findings to determine the effectiveness of ATOS design and performance.
c. By September 30, 2009, validate the process by performing a comparative analysis using actual data from the ATOS production site.
d. By November 15, 2009, make necessary adjustments to the process.
5. Develop FSEP job aids to assess the relationship between the certificate holding district office and the operator to assure field office compliance with agency policy.
a. By March 31, 2009, determine criteria and develop a desk audit process for determining the culture of the CMT and the Certificate Management Office (CMO)/Flight Service District Office (FSDO).
b. By June 30, 2009, develop an FSEP Job Aid with questions for</td></tr>
</table>

	determining the culture of the CMT and the CMO/FSDO. c. By August 31, 2009, beta test the desk audit process and the Job Aid. d. By October 31, 2009, make any necessary changes as a result of the testing. 6. Issued Notice N 1100.322, dated December 8, 2008, to establish the Audit and Evaluation Office (AAE) under the Office of the Chief Counsel.
Expected Results, this year and in the future	Track timely accomplishment of ATOS inspections on the Aviation Safety Dashboard. Provide quarterly reports to Congress on ATOS inspections that exceed frequencies for completion. Investigate safety issues identified by employees in a timely, comprehensive, independent manner via the Safety Issues Reporting System and the Internal Assistance Capability. By November 30, 2009: • Enhance FSEP processes and checklists to determine periodically field office compliance with ATOS policy and procedures. • Implement a risk-based process to target ACEP teams to perform periodic reviews of air carrier compliance. • Implement a process for conducting periodic reviews of the effectiveness of ATOS design and performance using ACEP data. • Develop FSEP job aids to assess the relationship between the certificate holding district office and the operator to assure field office compliance with agency policy. • Implement the FSEP desk audit and job aids to assess the relationship between the certificate holding district office and the operator to assure field office compliance with agency policy.

MANAGEMENT CHALLENGE	
Enhancing Aviation Safety and Maintaining Confidence in FAA's Ability To Provide Effective Oversight of a Rapidly Changing Industry	
Issue:	Maintaining Confidence in FAA's Oversight of Air Carriers and Certification and Production of New Segments of the Aircraft Industry – (b) Improving Certification and Production Oversight of New Segments of the Aircraft Industry General aviation certification requirements are inadequate to address the advanced concepts introduced in today's small aircraft.
ADDRESSING THE ISSUE	
Specific steps to be taken in FY 2009	The FAA will: • Continue to use special conditions to establish the appropriate certification standards until new rules are finalized. • Publish a Notice of Proposed Rulemaking (NPRM) that addresses updated certification requirements for part 23 turbojets. • Publish a revision to Advisory Circular (AC) in January 2009 that addresses the emergence of turbine engine powered part 23 airplanes. (Completed January 16, 2009). • Establish a rulemaking schedule by July 2009 to address certification function and reliability testing for part 23 turbojets under 6,000 pounds. • Established a team to develop software certification guidance in November 2008. • Develop a process for improved coordination of aircraft and operational certification. The FAA expects to complete the charter for this activity in November 2008 (complete) and will complete the Phase 1 activity in May 2009.
Expected Results, this year and in the future	In 2009, the FAA expects that new ACs and the coordination process will provide greater standardization of processes and improved communications between the design and operational standards staffs. In 2011, we expect completion of major rules and implementation of the remaining policy will further this standardization and communication.

MANAGEMENT CHALLENGE	
Enhancing Aviation Safety and Maintaining Confidence in FAA's Ability To Provide Effective Oversight of a Rapidly Changing Industry	
Issue:	Following Through on Longstanding Commitments To Improve Oversight of External Repair Facilities FAA's risk-based oversight system does not include critical repairs performed by non-certificated repair facilities. FAA does not have a specific policy governing when inspectors should initially visit repair stations performing substantial maintenance for air carriers. There is a need to require inspectors to conduct initial and follow-up on-site inspections of substantial maintenance providers to assess whether the maintenance providers comply with air carriers' procedures. FAA inspectors must ensure that air carriers and repair stations have strong audit systems to correct identified deficiencies, as FAA relies heavily on air carriers' oversight.
ADDRESSING THE ISSUE	
Specific steps to be taken in FY 2009	The FAA has strengthened and will continue to strengthen policy and guidance material requirements. FAA has instituted a risk-based repair station oversight system (FY 2005) to provide it with the ability to ensure contract maintenance activities are following proper procedures. The FAA has committed to define a new single definition of essential maintenance for the current terms being used today which are: "substantial maintenance," "critical," and "critical parts." All policy/guidance that used the terms substantial maintenance, critical maintenance, and critical parts are under review and will be replaced with the new definition of "Essential Maintenance". Expected completion date is July 30, 2009. There is an ongoing review of the air carriers Continuing Analysis and Surveillance System (CASS). This is the management tool that ensures the maintenance program objectives outlined in section 121.367 are met on a continuing basis, whether the work is accomplished by air carrier personnel or by a maintenance provider under contract to the air carrier. The FAA will publish a notice by September 30, 2009, placing special emphasis on ensuring the air carrier's on-site technical representative audit findings are documented during the ATOS performance assessments of element 1.3.7 and element 1.3.11. The FAA continues to evaluate the need for a possible "special emphasis" inspection on air carriers' CASS programs and their effectiveness. By September 30, 2009, the FAA will develop and publish clarification of FAA guidance on the initial on-site visit requirement by both air carrier and FAA for initial maintenance provider. <u>Initial visit</u> required within the first 90 days of adding essential maintenance provider. FAA is addressing the oversight of non-certified maintenance facilities by revising policy and guidance to define what is a "non-certificated" facility. Expected completion date is October 30, 2009. Along with defining "non-certificated" maintenance facilities, FAA has interfacing initiatives defining essential maintenance and the associated supporting guidance, the voluntary

	application Safety Management Systems (SMS) with both part 121 and part 145 certificated providers, and the effective performance of an air carriers CASS.
Expected Results, this year and in the future	• New definition of "essential maintenance". • Review of existing maintenance agreements. • New guidance on special emphasis for ensuring on-site technical representative follow- up on audit findings along with required documentation. • Revalidation of the requirement for initial on-site visit and follow up visits by both the air carrier and FAA when adding a new "essential" maintenance provider. • FAA's assessment of air carriers' CASS programs.

MANAGEMENT CHALLENGE	
Enhancing Aviation Safety and Maintaining Confidence in FAA's Ability to Provide Effective Oversight of a Rapidly Changing Industry	
Issue:	Improving Runway Safety By Implementing New Technologies, Making Airport-Specific Changes, and Reinvigorating FAA Initiatives Over the past several years, runway safety has seen substantial progress. The end of FY 2008 shows serious runway incursions are down 53 percent since FY 2001. We have implemented improvements in training programs, education and awareness, and new Air Traffic Control procedures. We have also made improvements in enhanced airport signage, layout, lighting and markings. However, the total number of runway incursions is increasing and some continue to be very serious events. Implementing new technology holds the promise of reducing runway incursions well below current levels.
ADDRESSING THE ISSUE	
Specific steps to be taken in FY 2009	New technology will complement other ongoing, proven runway safety initiatives including better air traffic control procedures; clearer airport signs, lights and markings; improved airport geometry including perimeter taxiways; enhanced training and education; and Runway Safety Action Team meetings. We plan to conduct over 100 Runway Safety Action Team meetings and over 100 pilot and flight instructor training meetings. Runway Status Lights and Airport Surface Detection Equipment-Model X installations will continue at airports throughout the year, specific installations will occur at Boston (BOS) and Los Angeles (LAX) and continue until the presently envisioned programs are completed in 2011. The Final Approach Runway Occupancy, Moving Map Displays, and Low Cost Ground Surveillance are in various stages of testing and development. Moving Map Display installations will commence in the cockpits of seven air carriers later this year as part of an operational study.
Expected Results, this year and in the future	As mentioned, serious runway incursions have decreased significantly. In FY 2007 (the safest year on record for the least number of serious incursions) and FY 2008, 24 and 25 serious runway incursions were reported, respectively. Based on the continued emphasis on runway safety, FY 2009 is expected to eclipse FY 2008 as the safest year on record regarding serious runway incursions. Further, total numbers of runway incursions that have been increasing annually by 13 to 14 percent, will be reduced below a baseline established in FY 2008. As the advanced technology systems are implemented, their expected cumulative effect is to further diminish the number of incursions and their severity.

<table>
<tr><th colspan="2">MANAGEMENT CHALLENGE</th></tr>
<tr><td colspan="2">Enhancing Mobility and Reducing Congestion in America's Transportation System</td></tr>
<tr><td>Issue</td><td>Reducing Delays and Improving Customer Service as the Airlines Struggle with Higher Fuel Costs

The FAA continues to work at reducing delays and meeting the anticipated demand for air travel. Congestion and delays cost the traveling public and aviation industry billions of dollars each year in added expense and lost productivity. One of the largest expenses for the aviation industry is the cost of jet fuel. When airlines incur taxi-delays or airborne delays they use even more fuel, thereby increasing their costs. This was particularly true in the summer of 2008 when jet fuel peaked at $3.92 per gallon. Although the cost of fuel was down to $1.31 per gallon by February 2009, most analysts believe the cost of jet fuel will increase again after the economy recovers.

The Next Generation Air Transportation System (NextGen) is the long term solution to reducing congestion and increasing capacity of the National Airspace. In the meantime, FAA and the Department of Transportation have implemented a number of initiatives to reduce delays. Some initiatives can be completed in the near term, while others are medium- and long-term in nature.</td></tr>
<tr><th colspan="2">ADDRESSING THE ISSUE</th></tr>
<tr><td>Specific steps to be taken in FY 2009</td><td>• Congestion Management at LaGuardia, John F. Kennedy and Newark Airports

The FAA issued final congestion management rules on October 10, 2008, to address escalating delay problems at New York's LaGuardia, JFK and Newark airports. However, in November 2008 several parties sued FAA; they petitioned a review of the final rules and sought a stay of the rules. On December 8, 2008, the United States Court of Appeals for the District of Columbia Circuit stayed the Congestion Management Rules, pending litigation.

The FAA believes some form of congestion management is necessary at these airports on a long-term basis. The FAA will continue to work in FY 2009 with stakeholders to seek recommended solutions and strategies for the New York airports.

▪ New York Area Operational Improvements.
The FAA's Air Traffic Organization (ATO) is working to implement several operational initiatives that will provide for increased efficiencies and reduce delays at the NY/NJ Port Authority run airports. The most noted initiatives include New York, New Jersey, and Philadelphia Airspace Redesign, the Short-Term Initiatives Workgroup, and continued work on the New York Aviation Committee's (ARC) list of 77 recommended fixes. To date, 26 of the 77 initiatives have been completed and several more are underway and expected to come on-line in FY 2009.

In addition, the U.S. military again worked with FAA to make some of its airspace available for civilian airliners over the Thanksgiving and Christmas holidays in 2008. The military opened up airspace off the east coast, which helped relieve congestion in the most congested regions from Maine to Florida.</td></tr>
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	• **O'Hare International Airport** The Congestion Management rule at Chicago O'Hare expired October 31, 2008. The sunset date was chosen in conjunction with the opening of the first new O'Hare Modernization Program (OMP) runway, which has added a modest amount of new capacity at the airport. Upon the expiration of the Congestion Management rule, FAA designated O'Hare as a Level 2 Schedules Facilitated Airport, in accordance with the International Air Transport Association Worldwide Scheduling Guidelines. In designating the airport as a Level 2 airport, the FAA can require all U.S. and foreign air carriers to report to the FAA their proposed scheduled operations at the airport, which will enable us to keep a pulse on the traffic levels and prevent excessive scheduling and delays, as occurred in 2004. The FAA will continue to monitor delay statistics at the airport as well as the progress of the OMP.
Expected Results, this year and in the future	The FAA expects to continue bringing operational improvements on-line that will provide for increased efficiencies and reduce delays in the New York metro area and nationwide, this year and in the future. Improvements include for example: the NY/NJ/PHL Airspace Redesign, a redesign of the Chicago airspace, and operational initiatives identified by the New York ARC. The Final ARC report, which includes the list of 77 operational initiatives, can be viewed at: http://www.dot.gov/affairs/FinalARCReport.pdf.

MANAGEMENT CHALLENGE	
Enhancing Mobility and Reducing Congestion in America's Transportation System	
Issue:	Keeping Airport Infrastructure and Airspace Projects On Track
ADDRESSING THE ISSUE	
Specific steps to be taken in FY 2009	Ongoing regional and headquarters review and reporting process. In FY 2009, three new runways, an end around taxiway, and a runway extension were scheduled to open. On November 20, 2008, three new runways opened at Washington Dulles, Seattle, and Chicago O'Hare allowing approximately 327,000 more annual operations at these three airports. The runways opened on schedule with the equipment, airspace procedures, and modifications needed to provide the expected benefits. On December 4, 2008, Dallas-Ft. Worth opened a new Southeast End Around Taxiway. On February 12, 2009 (one month early), a 1,040 foot extension to runway 17-35 was opened at Philadelphia International Airport. All FY 2009 projects were successfully opened on schedule.
Expected Results, this year and in the future	Reduce congestion by working with airports and local communities to build new airfield infrastructure. In FY 2010 a new runway is scheduled to be commissioned at Charlotte Douglas International Airport.

MANAGEMENT CHALLENGE	
Operating the National Airspace System While Developing and Transitioning to the Next Generation Air Transportation System	
Issue:	Hiring and Training 17,000 New Controllers Through 2017 The FAA developed the 2008 Controller Workforce Plan to guide its activities as the agency hires tens of thousands of controllers over the next 10 years. With so many new controllers being added to the ranks, the OIG has concerns regarding the composition of the controller workforce. The OIG further states that addressing training new controllers to the certified professional controller (CPC) level at their assigned locations will be a major challenge as FAA addresses controller attrition.
ADDRESSING THE ISSUE	
Specific steps to be taken in FY 2009	By September 30, 2009, FAA plans to: a. Add six more tower cab simulators and upgrade four existing tower cab simulators at the Academy to increase simulation time in initial courses. b. Evaluate other simulation options for Terminal Radar Approach Control and other Terminal facilities. Organizational changes at the National Headquarters with the addition of a new Vice President position have raised the prominence of the technical training function. By September 30, 2009, the FAA will transform its training infrastructure by increasing its capability for web based training at all air traffic control facilities. This will include the maturation of the National Training Database with the expansion of the enterprise learning management system to support both technical and non-technical training. FAA will publish an updated controller workforce plan that contains revised hiring targets for FY 2009. This year's plan will also incorporate additional information, such as facility-by-facility controller numbers and a new benchmark for trainee-to-controller ratios, as directed by Congress. The FAA uses many metrics (e.g., 35 percent trainees to total controllers ratio) to manage the flow of trainees while accomplishing daily operations. Facilities also meter training to coincide with a number of dynamic factors, including technology upgrades, new runway construction and recurrent proficiency training for existing CPCs. However, facility training is enabled by factors that are not reflected in those metrics. Examples include the use of contract instructors, access to simulators, scheduled overtime, and the seasonality and complexity of operations. In addition, the actual number of trainees does not completely represent the progress of each individual in the training program and/or the additional utility they provide which can help to supplement other on-the-job-training initiatives and/or support operations. More importantly, a key facility measure of training performance is whether trainees are completing their training within the agency's two-to-three year benchmark. Trainees are expected to complete their training within two years

	at Terminal facilities and three years at En Route facilities. FAA also continues to transfer veteran controllers to busier, higher-level facilities to reduce trainee-to-controller ratios at certain facilities.
Expected Results, this year and in the future	FAA will continue to closely monitor facilities to make sure that trainees are progressing through each stage of training while also ensuring the safe and efficient operation of the National Airspace System. The FAA plans to hire 1,742 controllers in FY 2009 and look closely at the percentage of trainees who complete training in the prescribed two years for Terminal and three years for En Route facilities. In FY 2009, FAA plans to complete and/or begin initial Academy course redesigns for Terminal, En Route, and System Operations for new controllers. It also plans to complete the Tower Simulation System deployment in the field and add additional simulators at the Academy. FAA also plans to make real progress in establishing web-based learning centers at air traffic control facilities.

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<tr><th colspan="2">MANAGEMENT CHALLENGE</th></tr>
<tr><td colspan="2">Operating the National Airspace System While Developing and Transitioning to the Next Generation Air Traffic System</td></tr>
<tr><td>Issue:</td><td>Keeping Existing Projects on Track and Reducing Risks With NextGen

The FAA's Next Generation Air Transportation System (NextGen) is a complex, multi-program undertaking requiring a multi-billion dollar budget. The challenge is to keep existing projects on track and reduce risks while integrating NextGen programs into the current operation of the National Airspace System.</td></tr>
<tr><th colspan="2">ADDRESSING THE ISSUE</th></tr>
<tr><td>Specific steps to be taken in FY 2009</td><td>1. Gap Analysis: The FAA is conducting an initial gap analysis between the existing NAS and the expected NextGen capabilities to determine funding priorities and the full range of adjustments necessary for existing capital programs until the transition to NextGen. This will provide a top-level overview of the NextGen mid-term (2012 – 2018) and long-term (2019 – 2025) requirements/needs identified.

The FAA is also conducting a more detailed analysis of requirements, establishing operational need timing, priorities and interconnections. These will be used by the system engineers to refine the allocation of changes not only to systems but to projected releases of these systems. This will increase the accuracy of the gap analysis and provide improved schedule estimates for the delivery of operational improvements. It will also provide increased detail to the infrastructure roadmaps. This activity will be completed in early FY 2009 to support the next round of investment decisions, e.g. mid-term En Route Automation Modernization (ERAM) beyond the current base-lined program.

2. Mid-Term Architecture: The FAA released a National Airspace System Enterprise Architecture (EA) update in January 2009. This version of the EA covers program goals through FY 2025. It includes detailed programmatic milestones through the NextGen mid-term (today through 2018) that clearly identify linkage between current system components and NextGen capabilities. The EA contains 12 infrastructure roadmaps: Aircraft, Air-Ground, Automation, Weather, Communication, Navigation, Surveillance, Airspace & Procedures, Enterprise Services, Facilities, Human Systems Integration, and Information Systems Security.

3. NextGen Workforce: Developing NextGen requires a skilled, specialized workforce. Findings and recommendations from a workforce needs analysis, conducted by the National Academy of Public Administration (NAPA), are being folded into a broader five-year FAA NextGen Acquisition Workforce Plan covering FY 2009-FY 2014, to be updated annually. This plan is scheduled to be completed in September 2009. This plan will contain descriptions of the acquisition workforce, challenges, workforce planning process, current views of the workforce and future demand, staffing/hiring plans, and strategies to address workforce gaps/needs. In order to provide immediate staffing support, 175 Facilities and Equipment positions have been allocated to the NextGen program. An additional 109 positions are included in the FY 2010 budget request.</td></tr>
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	4. NextGen Metrics: The NextGen Integration and Implementation Office will identify benefits targets for the NextGen mid-term. Metrics would ultimately be derived from this effort. The uncertainty around software requirements related to NexGen that are "expected to be in the billions of dollars" is not an ERAM issue today. Once Air Traffic Operations completes concept definition work for NexGen and allocates functionality to existing systems such as ERAM, the engineering and acquisition work necessary to plan and develop the required ERAM functionality in future releases will be accomplished. ERAM is being managed to get the basic Release 1 capability that replaces today's HOST operational at the Salt Lake City and Seattle Air Route Traffic Control Centers key sites. The en route team is working to achieve the key site initial operational capability, and beyond that execute a waterfall deployment to all sites after a successful In-Service Decision. Additionally, we have begun the development of Release 2, which includes System Wide Information Management and Automatic Dependent Surveillance-Broadcast functionality that will support the National Airspace System infrastructure necessary to implement NextGen.
Expected Results, this year and in the future	We expect to complete the developmental and implementation commitments laid out in the 2009 NextGen Implementation Plan.

MANAGEMENT CHALLENGE	
Operating the National Airspace System While Developing and Transitioning to the Next Generation Air Transportation System	
Issue:	Sustaining FAA's Extensive Network of Aging Facilities The ATO needs to develop a sustainable process to budget recurring maintenance to eliminate the current maintenance backlog and meet existing needs until NextGen is in place. The ATO also needs to identify target dates and realistic funding requirements for realigning and consolidating facilities into the appropriate mix of NextGen and legacy facilities that meet security and operational needs of the future.
ADDRESSING THE ISSUE	
Specific steps to be taken in FY 2009	Sustainment Air Traffic Operations-Terminal will review and plan for sustainment needs submitted via the Needs Assessment Program (NAP) tool and manage execution of the requirements via Corporate Work Plan tool set. ATO-Technical Operations will also track and program sustainment needs submitted via the NAP tool. By September 30, 2009, they will accomplish 150 Unstaffed Infrastructure Sustainment projects to include 30 shelter replacements, 30 steel tower inspections, 30 HVAC/air conditioning replacements, 30 roof repairs, and 30 access road repairs; as well as, complete 140 power system Sustainment projects to include replacement of 70 engine generators, 5 uninterruptible power systems and 65 battery systems. ATO-Technical Operations will also develop an unstaffed infrastructure Facilities Service Life Replacement Model to assist in tracking facilities replacement funding needs into NextGen. Under the American Recovery and Reinvestment Act (ARRA), FAA received $200 million in Facilities and Equipment (F&E) funding. Of this amount, $112.6 million is for the following 32 sustainment projects: 7 air route traffic control center (ARTCC) improvements; 3 tower/terminal radar approach control (TRACON) modernizations; 4 navigation and landing projects; and 18 power system replacements and upgrades. In FY 2009, FAA will track, monitor and report on project procurement, funding and status. We will also analyze and mitigate risks to ensure all funds are expended as prescribed by ARRA. NextGen In FY 2009, the NextGen facilities program will continue detailed analysis of facility requirements and operational concepts. ATO-Technical Operations will continue to review future needs of legacy systems in an effort to consolidate remaining legacy equipment and dispose of excess property.
Expected Results, this year and in the future	The primary deliverable from the planning perspective is the Concept of Use and the Preliminary Facility requirements document that will be completed by September 30, 2009. The inventory of legacy ATC equipment and commensurate Sustainment requirements should decrease as the equipment need is overtaken by the NextGen System.

MANAGEMENT CHALLENGE	
Protecting Against Increasing Cyber Security Risks and Enhancing the Protection of Personally Identifiable Information	
Issue:	Implementing a Robust Information Security Program to Protect the Department's Data and Operations To protect against, detect, and respond to information security threats affecting critical DOT and Cyber Security Management Center (CSMC) customer information technology assets.
ADDRESSING THE ISSUE	
Specific steps to be taken in FY 2009	By September 30, 2009: • Ensure capabilities exist for providing shared service provider services to new customers. • Develop and maintain catalog of cyber security service offerings and pricing information for prospective customers. • Establish and maintain a CSMC Project Management Office to provide project management services. Estimated completion date to be determined. • Acquire, implement, and maintain tools and resources for a formal automated project tracking mechanism. Estimated completion date to be determined. • Obtain signed service level agreement with new customers. • Acquire, implement, and maintain tools and resources to obtain feedback by creating and conducting periodic Customer Satisfaction Surveys. Ccompleted in February 2009. • Establish and maintain a CSMC Marketing Team with technical expertise to conduct site surveys and develop goals for new customers. Estimated completion date to be determined. • Develop relationships with new customers including specific agencies contacted during FY 2008. • Acquire, implement, and maintain tools and resources to create and update marketing vehicles such as pamphlets, newsletter articles, speaking engagements, and video.
Expected Results, this year and in the future	Outcomes and Performance Indicators • Optimized Mission Vigilance • Improved times between detection of incidents, reporting, and response for remediation • Zero security events that result in loss of live or critical infrastructure • Number of U.S. Computer Emergency Readiness Team reportable events that significantly disable or degrade the critical infrastructure

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<tr><th colspan="2">MANAGEMENT CHALLENGE</th></tr>
<tr><td colspan="2">Protecting Against Increasing Cyber Security Risks and Enhancing the Protection of Personally Identifiable Information</td></tr>
<tr><td>Issue:</td><td>Enhancing Security Protection of the Air Traffic Control System as a Critical National Infrastructure

The Air Traffic Operations has and continues to improve the methodology used to identify and test the security of the Air Traffic Control System. The FAA strictly adheres to the National Institute of Standards and Technology (NIST) guidelines for conducting assessments, which require system assessments rather than facility or site assessments (see NIST Special Publication (SP) 800-37). Addressing cyber security is critical in ATC systems because of potential air traffic delays and resultant National economic impacts that may be caused by air traffic control system outages caused by cyber security incidents.</td></tr>
<tr><th colspan="2">ADDRESSING THE ISSUE</th></tr>
<tr><td>Specific steps to be taken in FY 2009</td><td>The Air Traffic Operations Information System Security (ISS) Program has initiated in FY 2009 an Audit and Compliance Program that will perform compliance checks on critical air traffic control systems. At the end of FY 2009, the Audit and Compliance Program results will be available for review based on the following steps:.
• Audit and Compliance Program Plan to be completed April 1, 2009
• NAS Logical Access Study – 8 sites to be visited
  o 2 location visits complete (Oakland & Southern California Terminal Radar Approach Control)
  o New York, Chicago, Potomac Terminal Radar Approach Control, Aeronautical and Technical Centers site visits to be completed by June 30, 2009
  o Final report due September 30, 2009
• System Configuration Baseline audit on sampling of systems to assure that systems are actually configured as documented in their Certification and Accreditation(C&A) documentation – report is due August 31, 2009
• ISS Incident Mitigation audits to validate the mitigations implemented as a result of a security incident to assure they have been implemented as reported – initial report is due September 30, 2009

FAA has designated a recovery site to take over the responsibilities of inoperable En Route centers and has taken good steps toward preparing it, such as installing additional emergency power. FAA plans to have the recovery site ready for activation by March 2009. However, unresolved technical challenges and human integration issues could delay the recovery site's readiness. In addition, FAA needs to assess the potential impact on air travel should it have to activate business continuity plan operations. Mitigating the effects on the Nation's economic interests in the event that critical infrastructure is incapacitated is a key requirement of Homeland Security Presidential Directive-7.

The remaining set of materials needed to complete the critical power construction project has been ordered and most of it has been received. The project is now on track and scheduled for completion in May 2009.</td></tr>
<tr><td>Expected Results, this year and in the future</td><td>In FY 2009, we will complete two-thirds of C&A packages compliant with National Institutes of Standards and Technology 800-53 Rev. 2 requirements. In the future we expect to be 100 percent compliant by September 30, 2010.</td></tr>
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MANAGEMENT CHALLENGE	
Protecting Against Increasing Cyber Security Risks and Enhancing the Protection of Personally Identifiable Information	
Issue:	Enhancing the Protection of Personally Identifiable Information (PII) in DOT Systems The Department continues to face challenges in protecting personally identifiable information entrusted to it and needs to strengthen the protection of information technology (IT) resources in fiscal year 2009.
ADDRESSING THE ISSUE	
Specific steps to be taken in FY 2009	In 2008 the agency updated its privacy policy to align with the new OMB guidance. Each line of business and staff office have incorporated in their business plans for fiscal year 2009, activities to implement the FAA policy that protects its information assets, employees, and customers. These activities are: (1) Complete Privacy Threshold Analysis (PTA) for FAA systems in Department of Transportation's Cyber Security Assessment Management inventory; (2) Complete Privacy Impact Assessment, for systems that require one in the FAA Asset Inventory; (3) Remediation of targeted vulnerabilities identified in CSAM for those systems containing PII; and (4) Ensuring that employees and contractors comply with the Privacy policy's requirements for protecting PII data and reporting PII incidents. These activities are scheduled to be implemented by September 30, 2009.
Expected Results, this year and in the future	Results include but are not limited to: 1) Stabilize Information Assurance/Privacy Operations; 2) Build Enabling Privacy Infrastructure; 3) Implement Converged Physical Security and Privacy Information Governance.

MANAGEMENT CHALLENGE	
Improving Contract Operations and Maintaining Procurement Integrity	
Issue:	Developing and Maintaining a Competent Acquisition Workforce To Support the Department's Mission This is an ongoing concern that impacts all of government. Specifically, the ATO faces unprecedented acquisition workforce challenges. Today, FAA's acquisition portfolio is more complex than ever before and requires new approaches and skills to support NextGen acquisition work. The dispersion of acquisition talent across ATO has supported a more seamless, boundary-free acquisition management system, but makes identification and tracking of the workforce more difficult. The current demand for acquisition talent across the federal government outpaces supply, and, accordingly, the FAA is facing increased difficulty attracting the talent it needs. The demands of deploying NextGen will have a substantial effect on the management and development of the ATO acquisition workforce. The ATO can also expect a number of changing requirements distinct and for each of the acquisition disciplines.
ADDRESSING THE ISSUE	
Specific steps to be taken in FY 2009	Thus far in FY 2009, the FAA (1) participated in the federal government-wide skills assessment (conducted via the Federal Acquisition Institute) of contracting professionals, contracting officer technical representatives, and program managers. Based on the results of this assessment, competency strengths and gaps were identified and strategies were developed to close any identified gaps; and (2) implemented an audit process for its program management career development and certification policy, to monitor compliance with certification, education and development standards for program managers on acquisition programs. The FAA has formed an executive-level Acquisition Workforce Council which is facilitating the development of the five-year Acquisition Workforce Plan. This plan will contain descriptions of the acquisition workforce, current challenges and future trends, workforce planning process, current views of the workforce and future demand, staffing/hiring plans, and strategies to address workforce gaps/needs. Also provided in the plan is an implementation and accountability plan that outlines how the ATO will address the identified gaps over the next five years. This plan is scheduled to be completed in September 2009. The plan will be updated annually.
Expected Results, this year and in the future	For FY 2009 and beyond, the following actions include: • Conducting a Supply/Demand analysis and filling gaps according to the supply/demand analysis. The Acquisition Workforce Plan analysis and data will be used to focus recruitment and staffing on critical acquisition disciplines and gaps. • Institutionalizing the Acquisition Workforce Planning Process. Using the workforce plan and planning process as a basis for further development, the FAA will become more mature and precise in its acquisition workforce planning. ATO plans to publish updates to the Acquisition Workforce Plan on an annual basis. • Establishing an integrated Acquisition Career Development Program by utilizing current FAA initiatives and adopting additional government-wide best

	practice as appropriate. The FAA Acquisition Career Development program will leverage existing materials as appropriate and provide a framework for new and on-board acquisition professionals to develop in their careers. The program will highlight not only training and learning opportunities, but also developmental opportunities for advancement. In addition, the program will provide the career paths within and among other acquisition disciplines. The career development framework will identify feeder positions for acquisition professionals helping ATO managers to identify talent within the ATO. • Develop and Execute a Consolidated Acquisition Sourcing Plan. This strategy will focus on developing a plan to attract and recruit acquisition professionals into the ATO. It will help to coordinate and consolidate recruiting efforts for acquisition professionals across lines of business in the ATO.

Management Challenge	
Improving Contract Operations and Maintaining Procurement	
Issue:	Improving Award-Fee Contracting Processes to Better Achieve Acquisition Objectives
Addressing the Issue	
Specific steps to be taken in FY 2009	FAA will revise its Acquisition Management System to describe performance measures and contractor assessments. The following will be performed to accomplish this: • Complete and draft changes ready for coordination by August 31, 2009. • Coordinate of changes to be completed by October 1, 2009. • Briefed and obtain approvals by December 31, 2009. • Publish by January 31, 2010.
Expected Results, this year and in the future	Improved understanding of developing measurable criteria for assessing contractor performance under award fee contracts, and better documentation explaining basis for assessments.

MANAGEMENT CHALLENGE	
Improving Contract Operations and Maintaining Procurement Integrity	
Issue	Ensuring the Greater Acquisition Workforce Maintains High Ethical Standards
ADDRESSING THE ISSUE	
Specific steps to be taken in FY 2009	Develop training within six-month timeframe (August, 2009 goal). Present live and computer based training (remainder of calendar year).
Expected Results, this year and in the future	Heightened awareness of ethical responsibility to ensure timely action contemporaneously upon completion of training.

EXHIBIT IV-1
FY 2010 BUDGET REQUEST BY STRATEGIC GOAL AND PERFORMANCE GOAL APPROPRIATIONS, OBLIGATION LIMITATIONS AND EXEMPT OBLIGATIONS ($000)

STRATEGIC & PERFORMANCE GOALS BY PERFORMANCE MEASURE	FY 2008 ACTUAL	FY 2009 ENACTED (OMNIBUS)	FY 2010 REQUEST
1. SAFETY STRATEGIC GOAL			
A. Aviation Safety			
a. Reduce the Commercial Air Carrier Fatal Accident Rate (FY 2008)	8,214,126		
b. Reduce the Commercial Air Carrier Fatality Rate (FY 2009 & FY 2010)		8,654,532	4,614,820 [1]
c. Reduce General Aviation Fatal Accidents (FY 2008)	1,629,194		
d. Reduce the General Aviation Fatal Accident Rate (FY 2009 & FY 2010)		1,520,800	2,345,617 [1]
e. Other (Maintain Zero Commercial Space Transportation Accidents - FAA Flight Plan measure)	13,280	15,007	15,714
Subtotal Aviation Safety	**9,856,600**	**10,190,339**	**6,976,151**
B. Hazardous Materials Safety			
a. Reduce Serious Hazardous Materials Incidents	20,893	23,700	24,512
Subtotal Hazardous Materials Safety	**20,893**	**23,700**	**24,512**
Total – Safety Strategic Goal	**9,877,493**	**10,214,040**	**7,000,663**
2. REDUCED CONGESTION STRATEGIC GOAL			
A. Meet Air Transportation Demand			
a. Increase NAS On-Time Arrival Rate at the 35 OEP Airports	494,769	462,689	1,759,235
b. Increase Average Daily Airport Capacity for the 35 OEP Airports	3,527,282	3,584,459	4,894,304
Subtotal Meet Air Transportation Demand	**4,022,051**	**4,047,148**	**6,653,539** [1]
Total – Reduced Congestion Strategic Goal	**4,022,051**	**4,047,148**	**6,653,539**
3. GLOBAL CONNECTIVITY STRATEGIC GOAL			
A. Sustained International Leadership			
a. Secure a Yearly Increase in External Funding for Global Safety Initiatives (FY 2009 only)		18,505	
a. Promote International Aviation Development Projects (FY 2010 only)			18,964
Subtotal Sustained International Leadership		**18,505**	**18,964**
B. Harmonized Regulatory and Facilitation Requirements [2]			
a. Conclude Bilateral Aviation Safety Agreements and b. Expand the Use of NextGen Performance-Based Systems or Concepts in Priority Countries	57,777	43,838	48,901
Subtotal Regulatory and Facilitation Requirements	**57,777**	**43,838**	**48,901** [3]

EXHIBIT IV-1
FY 2010 BUDGET REQUEST BY STRATEGIC GOAL AND PERFORMANCE GOAL
APPROPRIATIONS, OBLIGATION LIMITATIONS AND EXEMPT OBLIGATIONS
($000)

STRATEGIC & PERFORMANCE GOALS BY PERFORMANCE MEASURE	FY 2008 ACTUAL	FY 2009 ENACTED (OMNIBUS)	FY 2010 REQUEST
C. Expand Business Opportunities			
a. Other (Meet FAA's Procurement Goals for Women-Owned and Small Disadvantaged Businesses)	553	725	840
Subtotal Expand Business Opportunities	**553**	**725**	**840**
Total – Global Connectivity Strategic Goal	**58,330**	**63,068**	**68,706**
4. ENVIROMENTAL STEWARDSHIP STRATEGIC GOAL			
A. Reduction in Pollution			
a. Increase Percentage of DOT Facilities Categorized as No Further Remedial Action Planned	39,081	38,798	102,385 [1]
b. Other (Reduce Exposure to Significant Aircraft Noise - FAA Flight Plan measure)	243,030	339,087	345,392
Subtotal Reduction in Pollution	**282,111**	**377,885**	**447,777**
B. Streamlined Environmental Reviews			
a. Reduce Median Completion Time for all Environmental Impact Statement (EISs) and Environmental Assessments (EAs)	34,874	46,406	46,551
Subtotal Streamlined Environmental Reviews	**34,874**	**46,406**	**46,551**
Total – Environmental Stewardship Strategic Goal	**316,985**	**424,291**	**494,328**
5. SECURITY, PREPAREDNESS AND RESPONSE STRATEGIC GOAL	**201,403**	**236,523**	**250,225**
6a. ORGANIZATIONAL EXCELLENCE STRATEGIC GOAL (FY 2008)	**438,677**		
6b. ORGANIZATIONAL EXCELLENCE STRATEGIC GOAL (FY 2009 & FY 2010)			
A. DOT's Organizational Excellence Initiatives			
a. Other (FAA Activities Supporting the Achievement of DOT's Organizational Excellence goals)		416,214	1,437,182
Subtotal President's Management Agenda		**416,214**	**1,437,182** [1]
B. Financial Stewardship			
a. Percentage of Major Federally Funded Transportation Infrastructure Projects with less than 2 percent Annual Growth in the Project Completion Milestone as Reported in the Finance Plan		2,000	2,092
b. Percentage of Financial Plan Cost Estimates for Major Federally Funded Transportation Infrastructure Projects with Less than 2 percent Annual Growth		2,000	2,092
Subtotal Financial Stewardship		**4,000**	**4,184**

EXHIBIT IV-1
FY 2010 BUDGET REQUEST BY STRATEGIC GOAL AND PERFORMANCE GOAL
APPROPRIATIONS, OBLIGATION LIMITATIONS AND EXEMPT OBLIGATIONS
($000)

STRATEGIC & PERFORMANCE GOALS BY PERFORMANCE MEASURE	FY 2008 ACTUAL	FY 2009 ENACTED (OMNIBUS)	FY 2010 REQUEST
C. Acquisition Management			
a. For Major DOT Systems, the Percentage of Scheduled Milestones Established in the Acquisition Project Baselines that are Met		32,390	23,587
b. For Major DOT Systems, the Percentage of Cost Goals Established in the Acquisition Project Baselines that are Met		32,390	23,587
Subtotal Acquisition Management		**64,779**	**47,173**
Total – Organizational Excellence Strategic Goal	**438,677**	**484,993**	**1,488,540**
GRAND TOTAL	**14,914,939**	**15,470,062**	**15,956,000**

[1] Changes for FY 2010 from FY 2009 levels are due to revisions in the ATO zero-based budget resulting from efforts to align business planning and budget goal allocation methods. See Summary Budget Request in the relevant Goal Sections of this Performance Budget for further details.

[2] For FY 2008, only the BASA measure was included in the Performance Budget, but the allocation for this measure included funding for External Funding and NextGen. External Funding was allocated separately beginnning in FY 2009, reducing the total funding allocated here, while BASAs and NextGen remained combined. The BASA measure was discontinued in FY 2010 - funding for BASA-related activities remains combined with NextGen.

[3] Changes for FY 2010 from FY 2009 levels are due to the increased allocation of ATO operations funding to support the international NextGen program and performance measure. For more information, see the Overview and Budget Request section on pages 4 through 6.

SAFETY

The safety of American aviation is unparalleled. Since 2001 there have been over 68 million successful flights on U.S. commercial aircraft. This represents over 4.1 billion passengers who have flown safely. By 2025, there will be added demands on the capacity of the system and FAA must steadily progress its plans and activities to be ready for the additional safety challenges.

As part of Vision 100, Congress chartered the Next Generation Air Transportation System (NextGen) Joint Planning and Development Office (JPDO) to jump-start the aviation system of tomorrow. This office uses the brainpower and resources of six cabinet-level offices to develop a blueprint for the aviation system in 2025 and, more importantly, a plan to get there. The plan for NextGen states that the demands on the system may triple from what they are today. It anticipates the need to handle new types of aircraft, such as very light jets being used as air taxis, and the integration of suborbital reusable launch vehicles into the NAS. Also, unmanned pilotless civil aircraft will fly cargo and one day, passengers.

Purpose of this Document

This document provides targeted information about the safety initiatives underway at FAA, and the progress the agency has made in reducing the Commercial Air Carrier Fatal Accident Rate. It also presents FY 2010 programmatic and resource needs to meet the challenges of increasing aviation safety and achieving targets set for the newly established Commercial Air Carrier Fatality Rate, which will replace the Fatal Accident Rate. This budget request supports the course toward the future, preserves existing services, and supports the agency's most important strategic objective of enhancing safety through oversight, operations, and research programs.

Document Organization

The document is structured around the four primary FAA safety performance goals. A brief description of the sections and the contents of each, follow.

1. **Reduce the Fatality Rate for Commercial Air Carriers** outlines the total budget request supporting this measure, presents an overview of commercial aviation safety performance, and provides the budget justification details. The budget justification is organized in the context of the three phases of flight — Preparing for Flight, Flight, and Post-Flight. Also, within each phase of flight discretionary increases related to that phase are provided. More detailed information supporting the requested increases is provided in the supplemental discretionary increase section.
2. **Reduce General Aviation (GA) Fatal Accidents** outlines the total budget request, presents an overview of GA safety performance, and provides the budget justification details. The budget justification is also organized in the context of the three phases of flight. More detailed information supporting the requested increases is provided in the supplemental discretionary increase section.
3. **Prevent Fatalities, Serious Injuries, or Significant Property Damage to the Uninvolved Public from Commercial Space Launches** outlines the total budget request, presents an overview of commercial safety launches performance, and provides the budget justification details. The budget justification is organized to detail programs that affect all phases of flight and related discretionary increases are also outlined.
4. **Reduce the Number of Serious Hazardous Materials Incidents in Transportation** outlines the total budget request, presents an overview of hazardous materials, performance, and specifies programs and related resource needs to support initiatives in FY 2010.

Context of this Document

In the agency's complex, interrelated system all FAA organizations play a role in ensuring aviation safety. However, for the commercial and GA performance outcome goals, Aviation Safety (AVS), Airports (ARP), and the Air Traffic Organization (ATO) lead the way. For the commercial space launch performance outcome goal, the Commercial Space Transportation (AST) organization assumes the lead. And finally, the Security and Hazardous Materials (ASH) organization leads the programs and initiatives for the performance goal – reduce hazardous materials incidents.

All four appropriations – Operations, Facilities and Equipment (F&E), Grants-In-Aid for Airports (AIP), and Research, Engineering and Development (R,E&D) – fund the vital aviation safety activities outlined in this document.

For complete disclosure of information technology funding that supports Department of Transportation (DOT) objectives, please refer to the justifications in Section 3, both in the Office of Information Services/Chief Information Officer detailed justification and in the ATO Capital Program.

In general, the summaries for activities in each goal section funded by Operations and AIP present the total amount assigned to that goal for the organization. For F&E and R,E&D the inserts show resources for selected individual projects/programs.

Summary Budget Request

This budget request supports *Increased Safety*, DOT and FAA's most important strategic objective. The FAA estimates that approximately $7 billion, nearly 44 percent of the agency's budget in FY 2010, will be required to maintain and improve the agency's safety programs. Table 1 (below) summarizes the Safety budget request by allocation. Table 2 provides the discretionary increase budget request by allocation. Exhibits IV-1 at the beginning of this section and II-3 in Section 2 provide additional details.

During the formulation of this request, ATO undertook a review of its method for allocating resources to DOT goals, comparing previous budget submissions with its Business Plans. In order to better align its zero-based budget with its plans, the organization has made bookkeeping revisions to its goal allocations for FY 2010. Specifically, the ATO Technical Operations Service Unit shifted funding and staffing from Commercial Aviation Safety to Congestion, supporting the concept that airport and airways facility and equipment repair and maintenance was more suited to the Congestion goal. Funding was shifted by various organizations from Commercial to General Aviation Safety as well. Resources were also shifted to Organizational Excellence in support of activities such as controller and administrative training and IT upgrades. Finally, a smaller amount was moved to Environmental Stewardship, to properly reflect ATO's efforts in this area.

These shifts do not reflect actual changes from FY 2009 in ATO programs or priorities. They have no substantive impact on any activities associated with the goals.

Table 1. Total Safety Budget Request

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2008 ACTUAL	FY 2009 ENACTED (OMNIBUS)	FY 2010 REQUEST
Reduce the Commercial Air Carrier Fatal Accident Rate (FY 2008 Only)			
Operations	7,297,365		
F & E	184,867		
RE&D	100,150		
AIP	631,744		
Subtotal	**8,214,126**		
FTE	**34,845**		
Reduce the Commercial Air Carrier Fatality Rate (FY 2009 & Fy 2010) [1]			
Operations		7,690,539	3,559,291 [2]
F & E		265,333	352,669
R,E&D		94,047	93,820
AIP		604,613	609,039
Subtotal		**8,654,532**	**4,614,820**
FTE		**36,059**	**21,043**
Reduce General Aviation Fatal Accidents (FY 2008 only)			
Operations	576,404		
F & E	172,580		
AIP	880,210		
Subtotal	**1,629,194**		
FTE	**3,904**		
Reduce the General Aviation Fatal Accident Rate (FY 2009 & FY 2010) [3]			
Operations		526,673	1,313,068 [2]
F & E		168,324	205,922
AIP		825,802	826,627
Subtotal		**1,520,800**	**2,345,617**
FTE		**2,831**	**6,256**
Reduce Serious Hazardous Material Incidents			
Operations	20,893	23,700	24,512
Subtotal	**20,893**	**23,700**	**24,512**
FTE	**142**	**147**	**149**
Zero Commercial Space Accidents			
Operations	13,280	15,007	15,714
Subtotal	**13,280**	**15,007**	**15,714**
FTE	**59**	**71**	**73**
Safety $ Total	**9,877,493**	**10,214,040**	**7,000,663**
Safety FTE Total	**38,950**	**39,108**	**27,521**

[1] This measure was first included in the FY 2009 President's Budget submitted in February 2007, replacing the Fatal Accident Rate, but it was subsequently implemented at the beginning of FY 2008. To retain consistency with the FY 2008 budget submission, the original measure is retained here. Since the two measures are equivalent, their funding allocations are the same.

[2] Changes for FY 2010 from FY 2009 levels are due to bookkeeping revisions in the ATO zero-based budget resulting from efforts to align business planing and budget goal allocation methods. These changes have no substantive impact on the requisite activities associated with this goal. For more information, see the Summary Budget Request Section above.

[1] This measure replaced GA Fatal Accidents in FY 2009, but since the two measures are equivalent, their funding allocations remain unchanged.

Table 2. Discretionary Increases

	($000)	FTE
OPERATIONS		
Air Traffic Organization		
Air Traffic Controller Hiring	4,548	53.0
Air Traffic Organization Total	*4,548*	*53.0*
Aviation Safety		
Unmanned Aircraft Systems Staffing	1,804	10.0
Substance Abuse Inspectors, SMS Analysts, ATC Specialist Medical Clearance Staff	800	5.0
Analytical Program Staffing	480	3.0
ASIAS Contract Support	3,720	0.0
Aviation Safety Total	*6,804*	*18.0*
OPERATIONS TOTAL	***10,352***	***71.0***
GRANTS-IN-AID FOR AIRPORTS		
Airport Program Manager Staffing for SMS	320	3.5
Electronic Engineer	80	0.5
Airspace Staffing	240	1.5
Wildlife Biologist	80	0.5
Private Airport Data Collection	300	0.0
Airport Technology Research	2,831	0.5
GRANTS-IN-AID FOR AIRPORTS TOTAL	***3,851***	***6.5***
TOTAL	***14,203***	***77.5***

Aviation Safety Overview

America continues to set the world standard for aviation, and safety is the hallmark of FAA. As the stewards of aviation safety in the United States, the agency and its industry partners have built a system that has reduced the risks of flying to all-time lows. In FY 2010 and beyond, FAA will continue to focus its resources—financial, human, and physical—primarily on safety.

The FAA oversees the world's largest, most complex aviation system, and serves millions of people who travel on commercial airlines, hundreds of thousands who make aviation their livelihood, and thousands more who fly for recreation. The level of public confidence in the safety of air travel has a huge impact on the U.S. economy. Today, travel and tourism account for one out of seven jobs in America.

In 1997, the White House Commission on Aviation Safety and Security issued a challenge to FAA and the aviation industry – to reduce the air carrier fatal accident rate by 80 percent in ten years. In response, FAA initiated a joint government-industry analysis of causal factors most frequently involved in aviation accidents. The resulting document, Safer Skies – A Focused Agenda, has formed the basis for joint government-industry efforts to reduce the number of accidents in both the commercial and general aviation areas.

By the end of FY 2007, FAA achieved a rate of 0.023 fatal accidents per 100,000 departures – a 57 percent drop. Although FAA did not achieve the target set ten years ago, FAA's safety achievements have been significant. In the three years prior to setting this goal, the U.S. averaged about six commercial fatal accidents per year. The average loss of life each year was 266 deaths.

Today, thanks to new technology, revised rules and procedures, and increased training, not only are there fewer commercial fatal accidents each year, but the chances of survival have increased significantly. In the past three years (FY 2006 – 2008) the United States averaged approximately 2.7 fatal accidents per year, with an average loss of life of 26. In addition, FAA's efforts during the past ten years have resulted in reduced general aviation fatal accidents and Alaska fatal accidents. Both measures are at their lowest recorded levels in history.

Through the continuing effort and cooperation of all the participants in the aviation industry and FAA, the aviation industry has achieved the safest period in history. For this reason, FAA introduced a new performance metric for commercial air carrier safety – Fatalities per 100 Million Persons On Board. This new metric is more relevant to the flying public, as it better measures the individual risk, as low as it is, to fly. And the long-term target is no less challenging than the previous goal – the agency aims to cut this risk in half by 2025. To make this vision a reality, FAA will continue to work in partnership with industry.

Partnership is the lynchpin of FAA's safety efforts. The agency constantly works with groups such as the Aircraft Owners and Pilots Association, Air Safety Foundation, Airline Pilots Association, Air Transport Association, Experimental Aircraft Association, GA Manufacturers Association, National Business Aviation Association, Allied Pilots Association, Association of Flight Attendants, airline and airport officials, manufacturers, and safety experts. Each group contributes to the safety of the National Airspace System NAS with technology, communications, and its unique expertise.

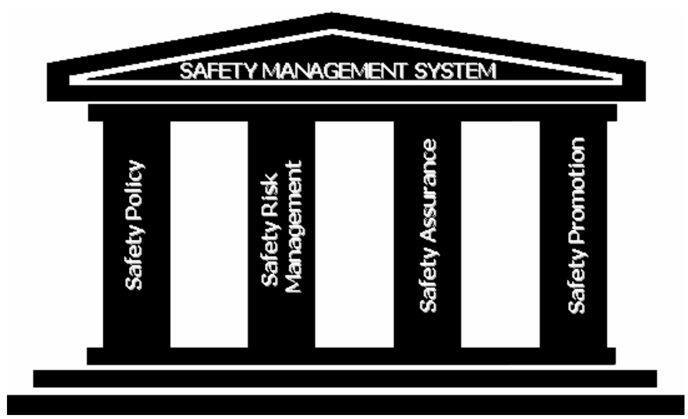
While maintaining it's regulatory and enforcement role, FAA and the aviation community have embraced three basic long-term strategies: 1) prevent accidents by addressing recurrent causes; 2) improve certification and surveillance; and 3) share safety data and information with aviation partners. These strategies are at the heart of most of FAA's long-term safety programs.

Safety Management Approach

As the aviation environment and industry changes, FAA must keep pace. The current processes and systems have served the agency well and have helped to create the safest aviation system in the world. To achieve the next level of safety, the traditional methods of analyzing the causes of an accident or incident, after the fact, are not enough. A more forward thinking approach is required to analyze trends, data, and systems to manage issues before they become incidents or accidents.

The FAA, along with other federal agencies and operators in the NAS, are adopting a system safety approach to safety management. This approach, called a Safety Management System (SMS), relies on developing standardized language, processes, and tools to manage safety risk. SMS relies on four components to manage risk:

- ➔ Safety Policy – Aligning procedures and processes in an organization to establish and meet safety objectives;
- ➔ Safety Risk Management (SRM) – Assessing risk in the system to identify and mitigate hazards;
- ➔ Safety Assurance – Continuously monitoring and updating the policies and activities to ensure that the processes work as intended; and
- ➔ Safety Promotion – Creating a safety culture that permeates every area of FAA's work at all levels of the organization.



The foundation of FAA's SMS is the Quality Management Systems (QMS) designed to manage organizational quality and to install precision in FAA's safety processes. The SMS is a system designed to integrate safety into FAA's quality processes. The FAA's Aviation Safety Organization (AVS) registered its QMS through the International Standards Organization (ISO) 9000 in FY2006.

Further, the SMS closes the gap between the International Civil Aviation Organization's (ICAO) safety management requirements and current FAA capabilities. ICAO is a United Nations organization that is dedicated to increasing the safety and security of international civil aviation. The organization addresses fundamental issues ranging from air navigation and capacity to emerging environmental concerns such as engine noise and emissions. The FAA, in concert with other U.S. Government bodies, coordinates a harmonious U.S. position that will be represented in the technical work conducted by ICAO panel and study groups.

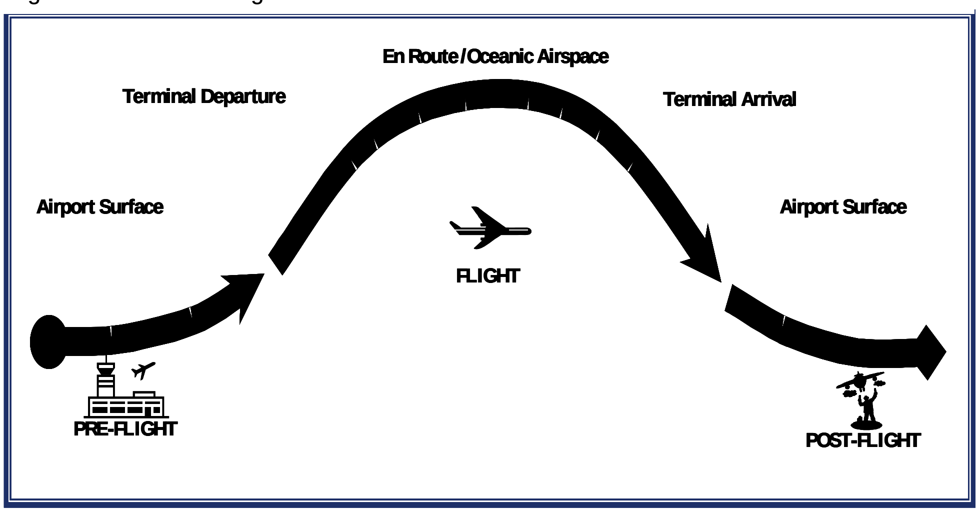
Performance Measure

Reduce Air Carrier Fatality Rate for Commercial and Scheduled Carriers

Section Organization

This section outlines the total budget request associated with this performance measure, presents an overview of commercial and scheduled air carrier aviation safety performance, and provides the budget justification details. The budget justification is organized in the context of the three phases of flight — Preparing for Flight, Flight, and Post-Flight. Also, within each phase of flight, discretionary increases related to that phase are provided. Figure 1 below illustrates the phases of flight and the associated air traffic control system responsible for providing services through all phases of flight.

Figure 1. Phases of Flight and the Associated Air Traffic Control Roles and Facilities



Air Traffic Control Tower (ATCT)	Terminal Radar Approach Control (TRACON)	Air Route Traffic Control Center (ARTCC)	Terminal Radar Approach Control (TRACON)	Airport Traffic Control Tower (ATCT)
- Ground Control - Local Control	- Departure Controller	- Radar Controller - Radar Associate - Assistant Controller	- Arrival Controller	- Tower Controller - Ground Controller

Budget Request

This funding request supports the DOT Safety strategic goal and FAA's Reduce Commercial Air Carrier Fatality Rate performance outcome goal. The FAA requests about $4.6 billion for programs contributing to the strategic objective to reduce the Commercial Air Carrier Fatality Rate.

Specifically, the budget request facilitates continued reductions in the fatality rate for passenger and cargo carriers. The FAA performance target is to reduce the number of air carrier fatalities per 100 million persons on board to 8.4 in FY 2009 and 8.2 in FY 2010.

Table 3-A summarizes FAA's progress since 2005 in meeting the Fatal Accident Rate performance targets and provides the agency's future targets. The rate includes both scheduled and nonscheduled flights of U.S. passenger and cargo air carriers (Part 121 of the Federal Aviation Regulation [FAR]) and scheduled flights of commuter airlines (Part 135 of the FAR). Table 3-B provides the performance target for the Commercial Air Carrier Fatality Rate per 100 million persons on-board measure. Table 4 summarizes the resources needed to achieve this goal.

Reducing Commercial Air Carrier Fatalities[1]: U.S. Fatalities per 100 Million Persons On Board						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	N/A	N/A	N/A	8.7	8.4	8.2
Actual	N/A	N/A	N/A	0.4[2]	N/A	N/A
Previous Measure: U.S. commercial air carrier fatal aviation accidents per 100,000 departures (last 3 years' average)						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	0.023	0.018	0.010	≤0.010	≤0.010	N/A
Actual	0.017	0.020	0.023[3]	0.023[2]	N/A	N/A

1 New metric replaces Fatal Accident Rate beginning in FY 2008. Through FY 2009, targets and results for both measures will be reported.
2 Preliminary estimate. Final data expected March 2010.
3 Actual result revised from preliminary estimate of 0.022 in FY 2009.

Table 4. Budget Request for Reducing the Commercial Air Carrier Fatality Rate

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2008 ACTUAL	FY 2009 ENACTED (OMNIBUS)	FY 2010 REQUEST
Safety			
Reduce the Commercial Air Carrier Fatal Accident Rate (FY 2008 Only)			
Operations	7,297,365		
F & E	184,867		
RE&D	100,150		
AIP	631,744		
Subtotal	**8,214,126**		
FTE	**34,845**		
Reduce the Commercial Air Carrier Fatality Rate (FY 2009 & FY 2010) [1]			
Operations		7,690,539	3,559,291 [2]
F & E		265,333	352,669
RE&D		94,047	93,820
AIP		604,613	609,039
Total		**8,654,532**	**4,614,820**
FTE		**36,059**	**21,043**

[1] This measure was first included in the FY 2009 President's Budget submitted in February 2007, replacing the Fatal Accident Rate, but it was subsequently implemented at the beginning of FY 2008. To retain consistency with the FY 2008 budget submission, the original measure is retained here. Since the two measures are equivalent, their funding allocations are the same.

[2] Changes for FY 2010 from FY 2009 levels are due to bookkeeping revisions in the ATO zero-based budget resulting from efforts to align business planing and budget goal allocation methods. These changes have no substantive impact on the requisite activities associated with this goal. For more information, see the Summary Budget Request Section for the Safety goal on page two.

Performance Overview

This remains one of the safest periods in aviation history for both commercial and general aviation. Over the last five years, nearly four billion airline passengers have safely reached their destinations. The NAS operates 31,000 scheduled commercial flights daily.

The FAA did not make its FYs 2006 – 2008 targets to reduce the Commercial Air Carrier Fatal Accident Rate. The FY 2007 rate for fatal accidents per 100,000 departures was 0.023. The FY 2008 rate for fatal accidents per 100,000 departures was 0.018. This still represents a remarkable decrease from the 1997 goal to reduce the Commercial Air Carrier Fatal Accident Rate by 80 percent in ten years. By the end of FY 2007, FAA achieved an impressive 57 percent of that goal. Few other government agencies have so seriously pursued achieving such an ambitious, long-term goal and achieved as significant an accomplishment as FAA.

In FY 2008, the FAA introduced a new safety performance measure for commercial air carriers, fatalities per 100 million persons on board. The new metric is more relevant than the previous one because it measures the individual risk to the flying public rather than for each departure. Now all fatalities, including passengers, crewmembers, ramp workers, and ground fatalities, are counted equally. The goal is a 50% reduction in fatalities by 2025. To meet this goal, the FAA will continue to work in partnership with industry. The FAA met its target for commercial air carrier fatalities in FY 2008 by achieving a rate of 0.4 fatalities per 100 million persons. Figure 2 below provides the new Commercial Air Carrier Fatality Rate, with prior year results and past and future FAA targets.

Figure 2. Historical Fatal Accident Rate (FY 1996 - 2025) and FAA's Targets (FY 1999 - 2009)

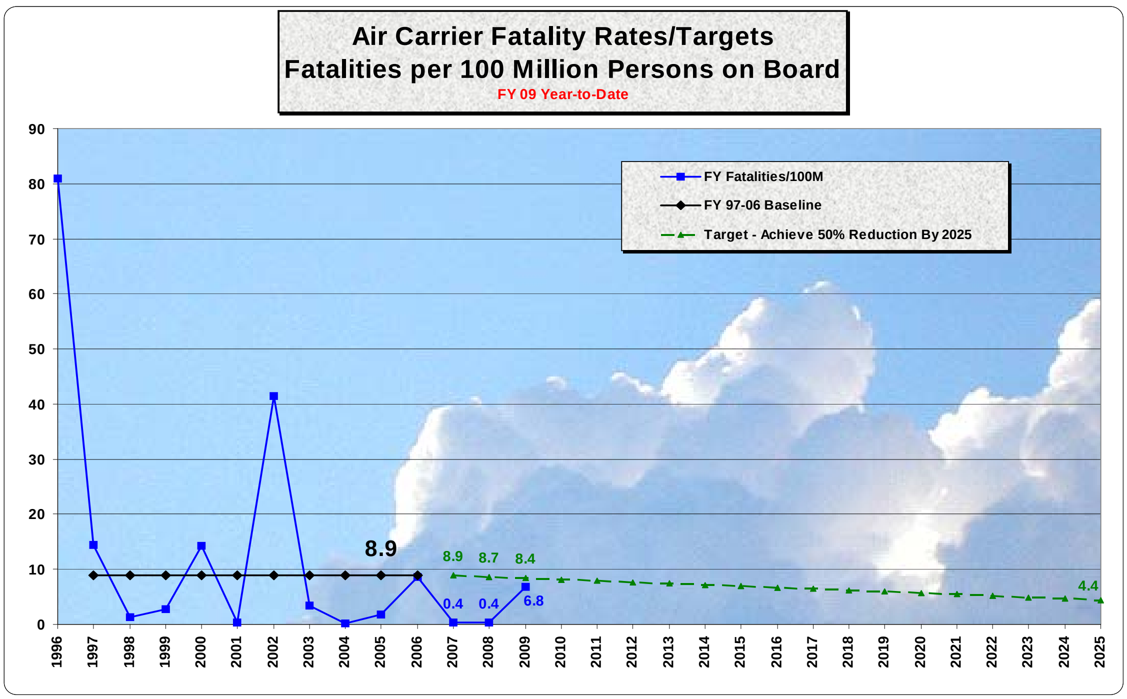
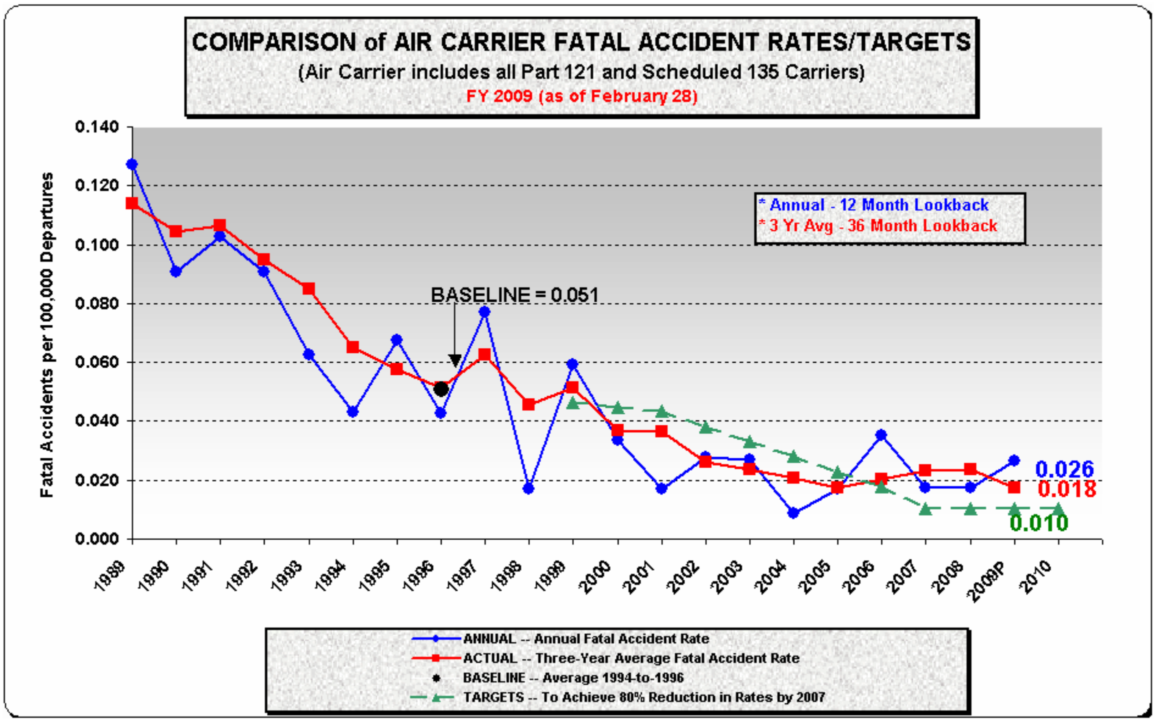


Figure 3 (next page) provides the historical Commercial Air Carrier Fatal Accident Rate and past and future FAA targets. It illustrates FAA's steady progress to further reduce the accident rate to 80 percent below the 1994–1996 baseline by FY 2007 and to maintain a rate below 0.010 thereafter. The rate includes both scheduled and nonscheduled flights of U.S. passenger and cargo air carriers (Part 121) and scheduled flights of commuter airlines (Part 135). This budget request supports the agency's core activities and provides for focused increases to improve performance.

Figure 3. Historical Fatal Accident Rate (FY 1989 - 2007) and FAA's Targets



All four FAA appropriations fund vital flight preparation activities and AVS, ARP, and the ATO lead the way.

Aviation Safety Organization. AVS has a singular mission — to promote aviation safety in the interest of the American public and the millions of people who rely on the aviation industry for business, commerce, and pleasure. To fulfill this mission, AVS directs and manages safety programs that fall into three primary areas, certification and licensing, standards and policy, and continued operational safety oversight and surveillance.

Office of Airports. As an organization, ARP provides leadership to the airport and aviation community to ensure that the National Plan of Integrated Airport Systems (NPIAS) is developed to meet the Nation's airport needs. ARP has a continuing stake in the safety, security, capacity, financial, and environmental aspects of airports. The organization's major business challenge is to improve runway safety, reduce runway incursions, improve capacity, and the condition of U.S. airports

Air Traffic Organization. The mission of the ATO is to identify aircraft collision risk and mitigate aircraft collision risks during the delivery of air traffic separation services. The separation of aircraft at appropriate distances is critical to maintaining safe air transportation. More than 15,000 air traffic controllers play a central role in separating aircraft from other aircraft, adverse weather, and obstacles through all phases of flight.

Budget Request Justification

Commercial Aviation Safety

PREPARING FOR FLIGHT
Aviation Safety Organization
Airports
Air Traffic Control Organization

The FAA focuses a substantial portion of its resources on safety prior to flight. The agency prepares each flight for takeoff by setting standards and providing oversight of all aviation related personnel and entities. In support of flight preparations AVS provides regulation and certification services; ARP establishes and maintains airport infrastructure and standards; and ATO delivers air traffic separation services.

The following table provides a guide to the contents of the Preparing for Flight section of this document.

COMMERCIAL AVIATION PREPARING FOR FLIGHT		
Aviation Safety Organization (AVS)	**Office of Airports (ARP)**	**Air Traffic Organization (ATO)**
Aviation Safety Services – Air Carrier, Equipment & Personnel - **Certify and License** - **Regulate and Inspect** **Discretionary Increases** **AVS Staffing Increases/Facility Expansion** - **Substance Abuse Inspectors** - **SMS Analysts** - **ATC Specialist Medical Clearance Staff**	**Establish and Maintain Airport Standards and Infrastructure** - Airport Safety, Standards, and Infrastructure - Establish and Maintain Airport Infrastructure **Discretionary Increases** - Airport Safety Management System - Electronic Engineer - Airspace Staffing - Wildlife Biologist - Engineering Technical Support Contract - Compliance Management Information System - Airport Technology Research	**Establish and Maintain, Facilities, Processes & Systems Technology** - Establish Air Traffic Control - Establish Integrated Safety Management System

Aviation Safety Services – Air Carrier, Equipment, and Personnel

(Operations, Aviation Safety, $914.8 million, 5,292 FTE)

This funding request supports the continued establishment of the highest safety standards for U.S. aviation standards. The regulatory foundation and vigilant oversight provided by FAA have a direct impact on reducing air carrier accidents. It is important to recognize that these high standards ultimately influence regulations set in many other countries.

The FAA, in its efforts to set aviation standards and provide aviation oversight, performs two key functions – it certifies and licenses people, equipment, and air carriers and it establishes strict regulatory standards and conducts inspections to ensure compliance with those standards. This section provides details on the activities associated with these functions and outlines discretionary increase needs to continue these efforts now and into the future.

Certify and License

The FAA certifies airlines, pilots, and planes before they are permitted to fly in the U.S. The agency oversees safety standards for airlines, commuter, on-demand operators, and other commercial operators. Airline pilots must meet agency standards for flight skills and medical fitness before they can fly commercial aircraft. The FAA also certificates non-pilot personnel essential to safe flight.

The agency is also responsible for licensing and certifying all new aircraft types and major components, such as engines and propellers. Aircraft and components manufactured in the United States and abroad are developed in concert with the agency to assure airworthiness. This is an enormous undertaking – each aircraft carrying commercial airline passengers receives multiple certifications from FAA. These certifications ensure that each and every aircraft meets the highest safety standards. FY 2010 funding for this core business activity is needed to oversee current and new certificates.

Regulate and Inspect

More than 6,000 FAA inspectors, engineers, medical personnel, and other critical safety staff oversee air carriers, manufacturers, repair stations, training schools, and pilots to ensure certificate holders continue to meet safety standards. The standards maintained by FAA's employees provide the basic framework of aviation safety. Each year, FAA conducts hundreds of thousands of inspections, including a growing number of international suppliers to major U.S. companies. If the agency discovers a violation of federal regulations, it brings an enforcement action. The FY 2010 funding request ensures consistently high standards and contributes directly to further reductions in the commercial accident rates and fatality rates. Because the workforce is small in comparison to the industry and public served by FAA, resources are leveraged through the designee system. The designee program authorizes private persons and organizations to perform many routine activities on behalf of FAA, allowing the agency to concentrate on the most critical safety areas. Designees also expand FAA access to technical expertise. The program enables more timely certification of individuals and companies. The FAA currently uses over 11,100 designees, plus another 28,000 people who are authorized to do specific work on behalf of the Administrator.

AVS Staffing Increases: Aviation Industry Drug Inspectors, Safety Management System Analysts, & Air Traffic Control Specialist Medical Clearance Staff - Discretionary Increase Request

(Operations, Aviation Safety, $800,000, 5.0 FTE)

The six inspectors (3 FTE) requested for the Aviation Industry Substance Abuse Program will increase the number of regulatory compliance inspections at aviation industry employers. At the end of FY 2008, the Substance Abuse Program had only 62 inspectors and investigators to oversee approximately 7,000 companies. The two safety management system analysts (1 FTE) will develop the capability to analyze aerospace medicine safety data in order to identify safety issues and conduct trend analysis to improve safety policies and meet the FAA *Flight Plan* goal to develop and implement a safety risk management program by FY 2010. AVS will also hire two positions (1 FTE) to support the Air Traffic Control Specialist (ATCS) health program. These additional positions will support significant increases in ATCS hiring and medical clearances.[1]

Commercial Aviation Safety

(Continued)

The following table provides a guide to the contents of this section of the Commercial Aviation Performance Goal and focuses on the activities of the Office of Airports in preparing for flight.

COMMERCIAL AVIATION PREPARING FOR FLIGHT		
Aviation Safety Organization (AVS)	Office of Airports (ARP)	Air Traffic Organization (ATO)
Aviation Safety Services – Air Carrier, Equipment & Personnel - Certify and License - Regulate and Inspect **Discretionary Increases** AVS Staffing Increases/Facility Expansion - Substance Abuse Inspectors - SMS Analysts - ATC Specialist Medical Clearance Staff	**Establish and Maintain Airport Standards and Infrastructure** - **Airport Safety, Standards, and Infrastructure** - **Establish and Maintain Airport Infrastructure** **Discretionary Increases** - **Airport Safety Management System** - **Electronic Engineer** - **Airspace Staffing** - **Wildlife Biologist** - **Engineering Technical Support Contract** - **Compliance Management Information System** - **Airport Technology Research**	**Establish and Maintain Facilities, Processes & Systems Technology** - Establish Air Traffic Control - Establish Integrated Safety Management System

[1] A request for $1.8 million and 10 FTE in Operations funding for Unmanned Aircraft System research and development appears under the General Aviation Fatal Accident Rate.

Establish and Maintain Airport Standards and Infrastructure

(Grants-in-Aid for Airports, Office of Airports, $609.03 million, 103.5 FTE)

Airport Safety, Standards, and Infrastructure

ARP is responsible for certifying commercial service airports to meet minimum safety requirements under Part 139 of the FAR. To support airport safety, FAA develops advisory circulars (AC) and equipment specifications, conduct research, and provide policy guidance.

Safety programs supported include:

Airport Certification and Inspection. ARP certifies commercial service airports under Part 139, which establishes minimum safety standards for airports. Certified airports are inspected periodically by FAA's Airport Certification and Safety Inspectors to ensure airports are meeting Part 139 requirements.

Implementation of Safety Management Systems (SMS) at Airports. In FY 2010, FAA will continue the implementation process for SMS at airports. The implementation of SMS at airports will be particularly useful to help mitigate the risk associated with the large amount of construction activity at airports. SMS moves from the traditional reactive approach of determining cause by analyzing accidents after they occur to a proactive approach where airports identify risks, document risks, and mitigate the risk during planning stages of airport development, and before changing airport geometry or procedures. SMS improves safety by instituting a formalized process for airports to proactively identify risks and to develop mitigation strategies to reduce those risks. FAA's airport SMS efforts will also harmonize the U.S with the ICAO requirements for airports SMS.

Airport Technology Research. The Airport Technology Research Program at FAA's William J. Hughes Technical Center, Atlantic City, New Jersey provides the technical basis to keep the agency's Advisory Circulars (AC) up-to-date. These technical documents provide airports guidance on how to comply with airport safety regulations. FAA's engineering and technical support staff develop AC and technical specifications. Regional engineers also review proposed airport safety and development projects. Airport safety research is conducted in the areas of airport design, aircraft rescue and firefighting, airport lighting and marking, and wildlife hazard mitigation.

Airport Cooperative Research Program (ACRP). The ACRP, administered by the Transportation Research Board (TRB) under an agreement with FAA, also conducts research on airport issues. The ACRP conducts research on problems identified by airports and other members from the aviation community. Research topics are solicited and a Board of Governors consisting of executives from airports, universities, consultants, airport associations, and FAA and other federal agencies select the most promising topics for funding.

Airport Safety Data. The FAA gathers information on all public-use airports for dissemination to pilots through the Airport Safety Data Program. This information is gathered by airport certification safety inspectors and by state inspectors funded by the agency. Information is entered into the National Flight Data Center database, published in the Airport Facility Directory, and incorporated on aeronautical charts. There are approximately 35 FAA airport certification safety inspectors who inspect 552 civilian airports.

Airport Geographic Information (GIS) System. ARP is developing the Airports Surveying – GIS Program. This program is an end-to-end process for the collection, validation, and central warehousing of airport data in a seamless digital stream from the point and time of collection, through validation and delivery to a centrally managed data warehouse.

Establish and Maintain Airport Infrastructure

The FAA funds a range of activities to ensure the safety of U.S. airports through grants and administrative support. This funding request directly supports efforts to reduce runway incursions, which reduces the risk of airline accidents. Requested FY 2010 funding will maintain the integrity of airport surfaces and structures nationwide and, where needed, will improve their condition.

Safety-related development receives priority consideration for AIP funding. The FY 2010 request continues support of initiatives to improve runway safety areas at airports to meet standards or to the extent practical, implement SMS at airports, reduce runway incursions, and improve infrastructure conditions.

Improvements to Runway Safety Areas. The agency's long-term goal to improve runway safety areas (RSA) will minimize damage to aircraft and injuries to those on board, once the aircraft leaves the runway surface. A plan for completing improvements at all RSAs has been developed. RSA improvements are frequently multi-year projects. Preliminary planning indicates that 75 percent of RSA improvements at priority runways will be completed by 2010 and all-practicable improvements at RSAs will be completed by 2015. FAA is also improving RSAs at non-priority runways to the extent practicable, and relocating or making frangible to the extent practicable FAA owned NAVAIDs that are in RSAs. Both the Non priority RSAs and the RSAs requiring NAVAID work will also be completed by 2015.

Runway Incursion Reduction. The FAA places a high priority on initiatives to reduce runway incursions. ARP will continue to implement recommendations that reduce their occurrence. These initiatives include enhanced runway and taxiway markings, improved lighting such as runway status lights, and improving driver training.

Infrastructure Conditions. The agency recognizes the safety benefits of ensuring that pavements at airports identified in the NPIAS are in good or fair condition and meet current safety and design standards. AIP will continue to support this goal. Also, AIP will continue to use its flexibility to maximize the funding to establish navigation aids (NAVAIDs) for eligible projects. The AIP and ATO, Capital Programs share the same eligibility for funding NAVAID projects.

Establish and Maintain Airport Standards and Infrastructure - Discretionary Increase Requests

(Grants-in-Aid for Airports, Office of Airports, $3.6 million, 6.5 FTE)

ARP requests discretionary increases to support Airport Standards and Infrastructure activities and initiatives. These requests will provide support for implementation of Global Information Systems and Safety Management Systems at airports, Airport Technology Research projects, and Airport Obstruction Evaluation studies. Funding for additional Airport Certification and Safety Inspectors is also requested. The specific resource needs for each discretionary increase request are outlined below.[2]

Airport Safety Management System (SMS) ($320,000, 3.5 FTE).
Eleven Airport SMS positions (5.5 FTE) are requested to implement SMS within the ARP organization and at more than 550 certificated airports. In November 2005, ICAO amended Annex 14, Volume I (Airport Design and Operations) to require member States to have certificated international airports establish an SMS. The FAA supports harmonization of international standards, and has worked to make U.S. aviation safety regulations consistent with ICAO standards and recommended practices.

SMS is a formalized process that requires staff to conduct safety risk management studies during the early stages of airport development and later in the process during construction. Risk analyses studies and development of risk mitigation is also required for changes in airport layout or operating procedures. There will also be added workload as SMS studies must be coordinated with the other lines of business and individual airports. SMS is widely accepted as necessary to move aviation to the next level of safety. However it does require significant increases in staffing to implement and integrate into the daily ARP activities.

The forecasted growth in air transportation will require new measures and a greater effort from all aviation product producers, including airport operators, to achieve a continuing improvement in the level of aviation safety. The use of SMS at airports can contribute to this effort by increasing the likelihood that airport operators will detect and correct safety problems before those problems result in an aircraft accident or incident.

Electronic Engineer ($80,000, 0.5 FTE)
An electronic engineer position (0.5 FTE) is required as new surveillance technologies are being implemented at airports that require closer coordination with the Air Traffic Organization. Systems such as runway status lights that are installed on airports but must connect to FAA owned surveillance systems (ASDE-X) radars require electronic engineering expertise in radar and other systems that are not currently available in the engineering division. Additionally, this position will provide evaluation of bird radar systems, low cost airport surveillance systems, and ramp surveillance systems.

[2] An additional increase of $800,000 in AIP funding for Private Airport Data Collection appears under the General Aviation Fatal Accident Rate measure.

Airspace Staffing ($240,000, 1.5 FTE)
Three airspace positions are requested to adequately conduct airspace evaluation of obstructions, and flight procedures. These positions must work closely with the 3 Air Traffic Service Centers to coordinate all the airspace issues between ARP and ATO. FAA intends to locate these 3 positions (1.5 FTE) at the 3 ATO Service Centers.

Wildlife Biologist ($80,000, 0.5 FTE)
A Wildlife Biologist is being requested to support the Wildlife Hazard Mitigation Program (0.5 FTE). Currently the FAA has only one wildlife biologist and that position was vacant over a year before it was filled. The wildlife strike that brought down US Air Flight 1549 highlights the importance of the FAA wildlife hazard mitigation work. The additional position is required to keep FAA's wildlife guidance up to date, sponsor and direct wildlife research and assist with conducting airport wildlife assessments requested by developing Nations.

Airport Technology Research ($2.8 million, 0.5 FTE)
ARP requests an additional one position (0.5 FTE) in FY 2010 and an increase of approximately $2.6 million to support research and development (R&D) projects. Each R&D project requires engineering support to develop proposals and plans, write statement of works, develop government cost estimates, review contractor proposals, monitor contractor performance and prepare R&D reports. Adequate staffing is needed to ensure quality research is conducted on time and within budget. The combination of increased requirements over the past several fiscal years and the complexity of the research projects require additional engineering staff to effectively manage the work and to ensure timely, high quality research products. Airport research currently underway includes research in airport design, airport pavement construction and maintenance, airport lighting and marking, aircraft rescue and firefighting, and wildlife hazard mitigation. The $2.6 million increase in FY 2010 is to start a new initiative for developing a visual aid test facility. This will allow engineers at the Airport R&D Branch at the FAA's William J Hughes Technical Center to readily reconfigure testing of new lighting systems. This funding request brings the total staffing in the Airport Technology Research Program to 23 positions and 22.5 FTE.

Commercial Aviation Safety
(Continued)

PREPARING FOR FLIGHT
Aviation Safety Organization
Airports
Air Traffic Control Organization

The following chart provides a guide to the framework of this section focused on the Commercial Air Carrier Fatality Rate performance measure and the activities of the AVS and ATO in support of safety in pre-flight preparations.

COMMERCIAL AVIATION PREPARING FOR FLIGHT		
Aviation Safety Organization (AVS)	**Office of Airports (ARP)**	**Air Traffic Organization (ATO)**
Aviation Safety Services – Air Carrier, Equipment & Personnel - Certify and License - Regulate and Inspect **Discretionary Increases** AVS Staffing Increases/Facility Expansion - Substance Abuse Inspectors - SMS Analysts - ATC Specialist Medical Clearance Staff	**Establish and Maintain Airport Standards and Infrastructure** - Airport Safety, Standards, and Infrastructure - Establish and Maintain Airport Infrastructure **Discretionary Increases** - Airport Safety Management System - Electronic Engineer - Airspace Staffing - Wildlife Biologist - Engineering Technical Support Contract - Airport Technology Research - Compliance Management Information System	**Establish and Maintain Facilities, Processes & Systems Technology** - **Establish Air Traffic Control** - **Establish Integrated Safety Management System**

Establish and Maintain Facilities, Processes, and Systems Technology

(Operations, Air Traffic Organization, $2.4 billion, 14,072 FTE)

During pre-flight, the ground controller monitors the runways and taxiways using ground radar to ensure aircraft do not cross active runways or interfere with movement. The local controller clears the flight for take-off. About five miles out of the airport, flights are handed off to the departure controller located at a nearby TRACON facility. From there, most of a commercial aircraft's flight passes under the direction of a controller at one of FAA's 21 Air Route Traffic Control Centers (ARTCCs).

Establish Air Traffic Control

Air traffic controllers are responsible for directing the movements of aircraft prior to takeoff, on the ground, and in the air. Air traffic control depends on the combined efforts of pilots, air traffic controllers, and maintenance technicians. The Air Traffic Control System Command Center in Reston, Virginia, concurrently monitors all air traffic and the operational status of the NAS. The Command Center's traffic management units address systemic problems and ensure that revised flight routes do not overload controllers' sectors.

The FAA funds contract towers staffed by non-federal air traffic controllers. The FY 2010 budget request includes $126.2 million for the contract tower program to provide safe, cost-effective services to smaller airports across the country. The average cost per tower has been increasing and contract tower costs are expected to average $509,000 in FY 2010, as compared to $486,000 in FY 2009.

The FAA forecasts commercial aircraft operations at contract-tower airports to grow an average of 1.2 percent annually during the 17-year forecast period, from 1.9 million to 2.3 million operations annually, an overall increase of 21.7 percent. Non-commercial activity is expected to slow, increasing only an average of 0.5 percent annually, from 14.0 million operations in FY 2008 to 15.2 million operations in FY 2025.

Establish Integrated Safety Management System (SMS)

The FAA's SMS is an integrated collection of processes, procedures, policies, and programs that address all aspects of air traffic control and navigation services, including airspace changes, air traffic procedures and standards, airport procedures and standards, and new and modified hardware and software. SMS is in use in ATO and AVS with processes and procedures designed specifically to the organization's activities.

In FY 2010 and beyond, SMS implementation will expand as ATO further develops and implements the Safety Risk Management (SRM) safety assessment methodology. The methodology is based on the estimation of risk (technical and/or operational) using an internationally applied mathematical model and associated statistical procedures. The SMS institutionalizes a comprehensive process to eliminate isolated safety decisions which at times, result in wasted time and resources. It includes processes to collect and analyze safety data, conduct reviews and evaluations of equipment, systems, operations policies and procedures, audit SMS implementation status and compliance, and continuously monitor data to identify trends and areas of potential risk thereby ensuring safe operations. SMS will be promoted through a series of initiatives including conducting the annual SMS summit, providing accessible networks for sharing lessons learned both domestically and internationally, providing on-going SMS workshops and distribution of SMS informational material throughout the FAA. In addition, safety culture surveys will be conducted within ATO to benchmark the current safety climate and support subsequent safety promotion activities.

A five-year training plan has been developed that includes training on SRM processes for operational practitioners and acquisition engineering practitioners. In FY 2010, SRM practitioner training courses will be revised to reflect current guidance and include more diverse NAS operational change scenarios. The enhanced training will provide practitioners with the knowledge, skills, and tools necessary for ensuring the successful application of the SRM process to operational changes in the NAS. The course also provides participants with an understanding of the SMS and how SRM is integrated within SMS. Additionally, the course provides in-depth information on SRM tools, documentation requirements, and the development of mechanisms to monitor controls and risk mitigation strategies developed during safety risk assessments. The course is tailored for operational employees, using examples and exercises relevant to their work.

The ATO's implementation of SMS will expand the collection, consolidation, and analysis of safety data to enhance reporting and assessment. The SMS Order, SMS Implementation Plan, and SMS Manual form the basic tenets of ATO's SMS. The overall policy and requirements for SMS are prescribed in the SMS Order.

The SMS Implementation Plan details implementation activities timeline and resources. The SMS Manual provides a systematic, explicit, and comprehensive approach for managing safety risks – mitigating the severity and likelihood of a hazard at all levels, throughout the entire scope of an operation and lifecycle of a system. Further, SRM will be fully integrated into safety significant changes and planning activities. The Flight Plan performance target for FY 2010 is to implement SMS in the Air Traffic Organization, Office of Aviation Safety, and Office of Airports.

Commercial Aviation Safety

(Continued)

FLIGHT
Aviation Safety Organization
Air Traffic Organization

Once a flight takes off, FAA employees and systems ensure its safe arrival at its destination by providing comprehensive oversight and air traffic control services. U.S. airlines operate about 35,000 daily departures and carry about 1.8 million passengers. All four appropriations contribute to this work. Likewise, in FAA's complex, interrelated system, all FAA organizations play a role in ensuring flight safety. ATO, AVS, and ASH take the lead. The major responsibilities of ATO and AVS are described below. Those of ASH are outlined later in this chapter in the Reduce Serious Hazardous Materials Incidents Section. The following table provides a guide to this section's contents.

COMMERCIAL AVIATION FLIGHT	
Aviation Safety Organization (AVS)	Air Traffic Organization (ATO)
Aviation Safety Services - **Aviation Safety Analysis System**	Establish and Maintain Flight Operations Systems Discretionary Increase - Air Traffic Controller Hiring Program F&E Programs - Terminal Doppler Weather Radar - Airport Surface Detection System - Runway Incursion Reduction Program - Runway Status Lights (RWSL)

Aviation Safety Services

(Operations, Aviation Safety, $914.8 million, 5,292 FTE)

Capital programs funded by the Operations appropriations support FAA's flight operations. This section highlights one of these capital programs – Aviation Safety Analysis System (ASAS) - Regulation and Certification Infrastructure for System Safety (RCISS).

Aviation Safety Analysis System - **Regulation and Certification Infrastructure for System Safety**
(Facilities and Equipment, Aviation Safety, $10.5 million)

This capital program provides automation hardware, software, and communications updates to support aviation safety information databases. For FY 2010, the request will enable this program to continue consolidating all previous Information Technology (IT) infrastructure programs that support AVS' safety workforce. RCISS will expand and enhance the current AVS infrastructure while leveraging components across AVS services. The safety workforce uses these databases to certify and regulate aircrews, airlines, and other licensed companies in aviation.   FAA safety inspectors use the information to determine if an airline is in compliance with good safety practices. RCISS will automate paper-based data repositories for such functions as determining medical fitness of FAA air traffic controllers, pilots, and other employees; examining the compliance history of aviation entities; reporting on investigations; and assessing facility security.

COMMERCIAL AVIATION FLIGHT	
Aviation Safety Organization (AVS)	**Air Traffic Organization (ATO)**
Aviation Safety Services - Aviation Safety Analysis System	**Establish and Maintain Flight Operations Systems** **Discretionary Increase** - **Air Traffic Controller Hiring Program** **F&E Programs** - **Terminal Doppler Weather Radar** - **Airport Surface Detection System** - **Runway Incursion Reduction Program** - **Runway Status Lights (RWSL)**

Establish and Maintain Flight Operations Systems

(Operations, Air Traffic Organization, $2.4 billion, 14,072 FTE)

This budget request provides the necessary resources to ensure the safe separation between the thousands of aircraft in U.S. airspace at any given moment. These resources are critical to maintaining a safe system.

Control Air Traffic[3]

During flight, most of a commercial aircraft's flight passes under the direction of a controller at one of FAA's 21 ARTCCs. The airspace monitored by each ARTCC covers thousands of square miles, divided into as many as eighty sectors. A team of up to four controllers is assigned to each sector, responsible for guiding the movement of aircraft through the Center's airspace, while separating them both horizontally and vertically. A flight can be handed off between several ARTCCs along its route. As it nears its destination, it is lined up with other approaching flights. As the flight nears completion, it is handed off to the approach controller at the TRACON serving the airport, and finally to the tower controller, who clears it for landing.

Air Traffic Controller Hiring – Discretionary Increase Request

(Operations, Air Traffic Organization, $4.5 million, 53.0 FTE)

The FAA requests $4.5 million to hire and train a net increase of 107 new controllers (53 FTE) in FY 2010. The lower hiring number reflects significantly lower traffic and the excess hiring over Plan in FY 2008.

From 1982 through 1991, the FAA hired an average of 2,655 new controllers per year as it began the massive task of rebuilding the controller work force following the 1981 strike. In the last 3 years, FAA has hired more than 5,500 new air traffic controllers and is on target to meet future requirements. As the FAA continues to bring these new employees on board, the agency carefully manages the process to ensure that trainees progress in a timely manner and are assigned where most needed. In the next decade, FAA must hire almost 15,000 air traffic controllers.
The FAA staffs to traffic, which enables the flexibility to align staffing with traffic volumes. Traffic has fallen 17 percent since the peak in 2000, and is not expected to return to peak levels in the near term. Despite that reduction, FAA plans to hire about 1,500 controllers per year to stay ahead of the training requirements for new controllers that will replace retiring controllers over the next decade. There are as many controllers on board today as there were in 2000, including thousands of trainees, and adjusted for traffic levels, there are more certified professional controllers (CPCs) on board today than in 2000.

In December 2004, FAA issued its 10 year strategy for future controller staffing in the report to Congress, *A Plan for the Future: The FAA's 10-Year Strategy for the Air Traffic Control Workforce.* The next annual update will be released in 2009. The plan describes how FAA will hire, staff, and train controllers. The plans also highlight the steps FAA is taking to place the right number of controllers in the right place at the right time to maximize the safety and efficiency of the NAS. The FAA staffs to traffic. This provides FAA the flexibility to match the number of controllers at its facilities with traffic volume and workload. The staffing targets contained in the updated Plan will be revised to reflect retirement and traffic projections.

Bringing aboard new controllers is a complex, time-consuming process. It takes several years to train a controller and the agency must constantly add to its pool of qualified recruits and trainees. Filling the job of a controller who retires today is the culmination of a process that must, by necessity, have begun several years in advance. In the past, the process required 3 to 5 years. By improving training techniques and using high-fidelity simulators, FAA has reduced the training period to 2 to 3 years. The FAA's goal is to limit the controller-to-trainee ratio to less than 35 percent of the workforce. This will ensure there are adequate numbers of fully trained controllers in all facilities. Fully certified controllers not only control air traffic; they also train developmental controllers. The $4.5 million request supports hiring for a net increase of 53 air traffic controllers in FY 2010, a level consistent with the updated staffing plan.

Facilities and Equipment – Air Traffic Organization

The ATO has many Facilities and Equipment programs that provide support to FAA's safety mission and safe flight operations. Four of these Capital Programs are highlighted in the following table – Terminal Doppler

[3] While the cost of salaries and benefits for all air traffic controllers is allocated to the Safety goal, funding for recruiting, hiring and training controllers is assigned to the Organizational Excellence Goal, in support of the FAA Flight Plan's Air Traffic Controller Hiring performance target. A summary of ATO's activities in these areas can be found in the Organizational Excellence section of this submission.

Weather Radar (TDWR), Airport Surface Detection Equipment, the Runway Incursion Reduction Program, and Runway Status Lights (RWSLs).

Air Traffic Organization Facilities and Equipment Programs Highlights		
Program	**Funding**	**Program Summary**
Terminal Doppler Weather Radar (TDWR) – Service Life Extension Program	$9.9 million	TDWR enhances the safety of air travel through timely detection and reporting of hazardous wind shear in and near an airport's terminal approach and departure zone by detecting microburst and gust fronts. The service life extension activity replaces existing components with more reliable components to help continue the TDWR operation until 2020. FY 2010 will fund the installation of the Radar Data Acquisition (RDA) retrofit modification and continue improving its software; continue the acquisition and installation of the replacement air conditioners, procure new radio frequency (RF) filter amplifiers, complete the acquisition of the uninterruptible power systems for the Radar Product Generator (RPG) computers, conduct continuing logistics supportability studies; and begin replacing the radomes; and replace the air conditioners at the remaining TDWR sites.

continued

Air Traffic Organization Facilities and Equipment Programs Highlights		
Airport Surface Detection Equipment - Model X (ASDE-X)	$17.3 million	The ASDE-X system provides air traffic controllers with a visual representation of the traffic situation on the airport surface movement area and arrival corridors. This increased awareness on the airport surface movement area is essential to reduce runway collision risks and critical Category A & B runway incursions. There are a total of 35 operational systems and three support systems planned FY 2010 funding will go toward continuing implementation activities including site preparation, equipment installation and system optimization at 16 airports. Four systems will be delivered and 13 airports plan to achieve IOC. Remaining funds will be used for systems engineering, interim contractor depot level support (ICDLS), second level engineering support, initial telecommunication services, and contractor support for the program office.
Runway Incursion Reduction Program	$10.0 million	Reducing the risk of runway incursions is a key FAA safety goal and remains on the NTSB's "Most Wanted" list of critical safety issues. The reduction of high-hazard runway incursions remains the key safety objective as specified in FAA's Flight Plan. The RIRP will remain a catalyst to initiate acquisition activities to facilitate transition of promising safety technologies that have reached a level of maturity deemed appropriate for NAS transition and implementation. FY 2010 funds support delivery of performance targets outlined in the FAA Flight Plan and ATO Safety Business Plan. Specifically, funding supports: (1) completion of Low Cost Ground Surveillance (LCGS) pilot program operational trials and the transition from the pilot to a national implementation program; (2) completion of the Runway Intersection Lights operational trials; (3) development of a low cost runway status lights (RWSL) system design for application at non-ASDE-X airports; (4) development of automated taxiway guidance concepts; (5) evaluation of LED technology for application in runway safety systems; and (6) evaluation of airport wireless data communications system design alternatives.
Runway Status Lights (RWSLs)	$117.3 million	RWSLs act as stoplights on runways and taxiways, signaling when it is safe to enter, cross or begin takeoff on a runway. Located along the centerline of a runway or taxiway, Runway Entrance Lights and/or Takeoff Hold Lights will illuminate red when a runway is in use, notifying the pilot of a taxiing aircraft to either stop prior to crossing the runway, or yield to the aircraft landing or taking off. Since most runway incursions are caused by pilot deviations, RWSLs are a vital layer of redundancy in runway safety and provide a back-up and reinforcement of controller guidance. In addition, this program helps establish an international standard that incorporates human factors principles for this type of safety technology. For FY 2010, funding will complete installation at key site, implementation activities at all other airports to include site specific construction, design activities, and equipment procurement. Remaining funds will be used for systems engineering support, establish support systems as well as contractor support to the program office and Independent Operation Test and Evaluation (IOT&E).

POST FLIGHT
Aviation Safety Organization
Air Traffic Organization

Commercial Aviation Safety
(Continued)

Once a flight lands, the agency is responsible for its safe arrival at the gate. The FAA learns from each flight by gathering and analyzing data to incrementally improve safety throughout its complex system. With appropriate funding to support post-flight evaluation activities, the agency will be able to gather information to identify and address vulnerabilities in the system. The following table provides a guide to the post-flight portion of this section.

COMMERCIAL AVIATION POST-FLIGHT	
Aviation Safety Organization (AVS)	**Air Traffic Organization (ATO)**
Set Standards and Provide Oversight **Discretionary Increase** - **ASIAS and Contract Funding** - **ASA Staffing**	**Control Air Traffic** **Ensure Future Air Traffic Control Safety** - Research, Engineering, & Development Programs

Set Standards and Provide Oversight
(Operations, Aviation Safety, $914.8 million, 5,292 FTE)

Aviation safety is a continuous loop — establishing safety standards and policies; ensuring all aviation personnel, organizations, and equipment meet these standards; performing ongoing risk analyses and evaluations; and implementing improvements — all in an effort to avoid the causes of accidents before they occur. However, when accidents or incidents do occur, the agency ensures that it learns from them. The agency participates in every aviation accident investigation conducted by the NTSB.

The FAA gains additional information about risks and greater understanding about mitigating them through voluntary safety programs and data analysis. Two major voluntary programs for air carriers are the Aviation Safety Action Program (ASAP) and Flight Operational Quality Assurance (FOQA). ASAP encourages air carrier employees to voluntarily report critical safety information. FOQA collects and analyzes digital flight data generated during normal operations.

FAA is also developing the Aviation Safety Information Analysis and Sharing (ASIAS) system. The ASIAS system enables users to perform data analysis across multiple databases, search an extensive warehouse of safety data, and display the data in an array of useful formats. This system is part of the effort to transform aviation oversight from reactive and diagnostic surveillance to a risk-based approach (i.e., proactive and prognostic).

The agency also periodically issues Airworthiness Directives (AD), the agency's most stringent measure aimed at increasing aviation safety. An AD is a mandatory regulatory action designed to bring an aircraft to a prescribed level of safety. The agency also undertakes rigorous analysis of all new technologies before they are implemented to assure their safety.

ASIAS Contract Support - Discretionary Increase (Operations, Aviation Safety, $3.7 million, 0.0 FTE)

The funding will be used to acquire ASIAS licenses for safety databases and contract support to establish the network connecting ASIAS with each of the airline nodes. The capability will enable analysts to integrate Flight Operational Quality Assurance (FOQA) data from across the commercial airline industry to identify emerging safety hazards.

Analytical Program Staffing - Discretionary Increase
(Operations, Aviation Safety, $480,000, 3.0 FTE)

The six positions (3 FTE) will support establishing a world-class, analytical capability based on SMS principles and sound safety data/information analysis and sharing processes, incorporating future hazard/emerging risk assessment. The staff will analyze emerging risks, future hazards and trends in the NAS. Staff will develop business case models to support and validate safety enhancements.

COMMERCIAL AVIATION POST-FLIGHT	
Aviation Safety Organization (AVS)	Air Traffic Organization (ATO)
Set Standards and Provide Oversight	Control Air Traffic Ensure Future Air Traffic Control Safety - Research Engineering and Development Programs

Control Air Traffic

(Operations, Air Traffic Organization, $2.4 billion, 14,072 FTE)

As an aircraft approaches its destination, it is handed off to the approach controller at the TRACON serving the airport. The tower controller then updates pilots with the latest weather conditions, ensures proper spacing between aircraft, and clears the flight for landing. The ground controller monitors the runways and taxiways using ground radar information to ensure that taxiing aircraft do not cross active runways or interfere with movement on the ground. As before takeoff, an airport's ground controller directs aircraft to keep it apart from other aircraft and on the right path to the terminal once it lands. Ground controllers are often responsible for coordinating dozens of vehicles, from aircraft to baggage carts to passenger transports.

Ensure Future Air Traffic Control Safety

(Research, Engineering, & Development, $91.1 million)

The following are samples of the many research programs, funded by the R,E&D appropriation, which progress the body of knowledge related to critical safety challenges and support the mitigation or elimination of risks. As aviation technology and operating environments evolve, so must the tools and processes that ensure safety. This resource request is vital for FAA to look beyond the immediate environment and to ensure that products are delivered without increased risk, in a timely manner, and with benefit to the public. The programs support increased safety and capacity and reduce the environmental impacts of aviation.

Research, Engineering, & Development – Sample Programs Ensure Future Air Traffic Control Safety		
Program	**Funding**	**Program Summary**
Fire Research and Safety	$7.8 million	The Fire Research and Safety program develops technologies, procedures, test methods, and criteria to prevent accidents caused by in-flight fires and fuel tank explosions and improve survivability during a post-crash fire. Research will continue to examine fire behavior of structural composites such as those used in the new Boeing 787, the first large transport aircraft with a composite fuselage and wings. In FY 2010, a test will be developed to measure the in-flight fire resistance of composite fuselage materials. Longer term applied research on fire-proof cabins will continue to develop enabling technology for ultra-fire resistant interior materials and facilitate the transfer of that technology to the private sector.
Advanced Materials/ Structural Safety Program	$2.4 million	The Advanced Materials/Structural Safety Program aims to ensure the safety of civil aircraft constructed of advanced materials and increase accident survivability by improving crash characteristics of aircraft structures and systems.
Atmospheric Hazards/Digital System Safety	$4.5 million	The Atmospheric Hazards/Digital System Safety program develops and validates technologies and procedures that increase flight safety in adverse atmospheric conditions, including icing conditions and electrical interference.
Aging Aircraft/Continued Airworthiness Program	$10.9 million	The Continued Airworthiness/Aging Aircraft Program develops technologies and practices to help ensure the continued airworthiness of aircraft structures and systems in the civil transport fleet. One research and development goal for this program is to develop new inspection tools to assure the long term safety of metallic and composite structures.

Research, Engineering, & Development – Sample Programs Ensure Future Air Traffic Control Safety		
Aviation Safety Risk Analysis/System Safety Management	$12.7 million	The System Safety Management/Aviation Safety Risk Analysis Program develops risk management methodologies, prototype tools, technical information, and safety management system procedures and practices that will improve aviation safety. In addition, the program aims to develop an infrastructure that enables the free sharing of de-identified, aggregate safety information that is derived from various government and industry sources in a protected, aggregated manner. It also conducts research to evaluate proposed new technologies and procedures, which will improve safety by making relevant information available to the pilot during terminal operations.
Aeromedical Research	$10.4 million	The Aeromedical Research Program focuses on enhancement of the safety, security, and health of humans in the NAS. The program investigates injury and death patterns in civilian flight accidents to determine causes and develop prevention strategies. Advanced molecular biological methods are being developed to objectively define and track pilot and crew fatigue. Equipment and procedures are developed to improve egress from aircraft and the strength of aircraft passenger seats. The program also analyzes pilot medical certification standards, as well as medical, toxicological, and physiological aspects of accidents. In FY 2010, the program will complete development and validation of computational models of air contaminants, volatile organic compounds, and biological and viral contaminants to evaluate health impacts on passengers and crew. The program will recommend methods to reduce head, neck, torso, and extremity injuries in aircraft crash environments to improve evacuation capability and improve certification procedures.
Weather Program	$16.8 million	The FAA Weather Research Program conducts applied research to develop weather products that provide more accurate warnings and forecasts. National laboratories, government agencies, and universities perform the research. Products are deployed into NAS components and National Weather Service systems to support safety and efficiency. In FY 2010 a consolidated convective weather forecast capability will be developed that will enhance terminal and en-route capacity. The program will provide knowledge that can be used by FAA to support design approvals for weather data link systems and to issue appropriate operational approvals for weather products for use in the cockpit.
Flightdeck/ Maintenance/ System Integration Human Factors	$7.1 million	Technical information and advice to improve pilot, inspector, maintenance technician, and aviation system performance. The program focuses on the development of guidelines, tools, and training to enhance error capturing and mitigation capabilities in the flight deck and maintenance environments. It also develops human performance information that the agency provides to the aviation industry for use in designing and operating aircraft and training pilots and maintenance personnel. In FY 2010 research will include an investigation of automation and new technology impacts on aviation maintenance processes, safety, tasks, technician skills, the needs for regulation.
Air Traffic Control/ Technical Operations Human Factors	$10.3 million	This Air Traffic Control/Technical Operations Human Factors Program develops the human factors elements that enable air traffic control systems of the future and provides better methods to address human error in operations and maintenance. Tests and criteria for the selection of operational personnel hold promise to identify the best job candidates and to reduce costs associated with attrition and training failures. FY 2010 funding will support the development of a human factors display standard that will be used as system design requirement to develop common air traffic control display platforms.

Performance Measure
Reduce the General Aviation Fatal Accident Rate

Section Organization

This section outlines the total budget request, presents an overview of general aviation safety performance, and provides the budget justification details. The budget justification is organized in the context of the three phases of flight. Figure 3, below depicts the phases of flight and the associated air traffic roles and facilities that support GA safety.

Air Traffic Control Tower (ATCT)	Terminal Radar Approach Control (TRACON)	Air Route Traffic Control Center (ARTCC)	Terminal Radar Approach Control (TRACON)	Airport Traffic Control Tower (ATCT)
- Ground Control - Local Control	- Departure Controller	- Radar Controller - Radar Associate - Assistant Controller	- Arrival Controller	- Tower Controller - Ground Controller

Budget Request

This funding request contributes to the DOT Safety strategic goal and to the General Aviation Fatal Accident Rate performance measure. This resource request for over $2.3 billion supports FAA efforts to incrementally reduce the general aviation fatal accident rate, including accidents in Alaska.

The performance history and targets are displayed in Table 5-A and Table 5-B provide the performance target for the newly defined FY 2009 General Aviation Fatal Accident Rate. The resources needed to achieve this goal are provided in Table 6.

General Aviation Fatal Accident Rate[1]: Reduce the rate of fatal general aviation accidents						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	N/A	N/A	N/A	N/A	1.11	1.09
Actual	N/A	N/A	N/A	N/A	N/A	N/A
Previous Measure: Reduce the number of fatal general aviation accidents						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	343	337	331	325	319	N/A
Actual	354	301	313	299[2]	N/A	N/A

[1] In FY 2009, metric changed to General Aviation Fatal Accident Rate.
[2] Preliminary estimate. Final data expected March 2010.

Table 6. Budget Request for Reducing the General Aviation Fatal Accident Rate

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2008 ACTUAL	FY 2009 ENACTED (OMNIBUS)	FY 2010 REQUEST
Safety			
Reduce General Aviation Fatal Accidents (FY 2008 only)			
Operations	576,404		
F & E	172,580		
AIP	880,210		
Total	**1,629,194**		
FTE	**3,904**		
Reduce the General Aviation Fatal Accident Rate (FY 2009 & FY 2010) [1]			
Operations		526,673	1,313,068 [2]
F & E		168,324	205,922
AIP		825,802	826,627
Total		**1,520,800**	**2,345,617**
FTE		**2,831**	**6,256**

[1] This measure replaced GA Fata Accidents in FY 2009, but since the two measures are equivalent, their funding allocations remain unchanged.

[2] Changes for FY 2010 from FY 2009 levels are due to bookkeeping revisions in the ATO zero-based budget resulting from efforts to align business planing and budget goal allocation methods. These changes have no substantive impact on the requisite activities associated with this goal. For more information, see the Summary Budget Request Section for the Safety goal on page two.

General Aviation Overview

General Aviation (GA) is a catalyst for economic growth. It's an integral part of the U.S. economy, supporting 1.3 million jobs and over $102 billion of total economic activity. Businesses that use GA gain competitive advantage, while communities gain jobs and access to the nation's air transportation system.

Although most people are familiar with FAA's role in commercial aviation, they may not be aware that it also oversees the safety of almost 300,000 GA aircraft in the United States. GA aircraft and activities subject to FAA oversight are outlined in the table that follows.

FAA GENERAL AVIATION OVERSIGHT	
Aircraft	**Activities**
- Single-seat home-built airplanes	- Student training
- Rotorcraft	- Crop dusting
- Balloons	- Fire fighting
- Extended-range turbojets	- Law enforcement
- Unmanned aerial vehicles	- News coverage
- Micro-jets	- Sightseeing
	- Industrial work
	- On-demand air taxi service
	- Corporate transportation
	- Personal use /recreational flying

There are approximately 242,000 private pilots in the U.S. and some 220,000 active GA aircraft. Each year, GA aircraft transport only about one-fourth the number of people who fly on U.S. commercial airlines, but in most years more people perish from GA accidents. Therefore, reducing the rate of fatal GA accidents is a top priority for FAA. The new General Aviation Fatal Accident rate introduced for FY 2009 to replace the number of fatal accidents is a rate-based metric that tracks changes in the fatal accident rate for a fixed volume of flight hours. The FAA's original goal was to reduce the number of accidents to 319 per year by FY 2009. The new performance target baseline covers the three-year period from May 2005 through June 2008, the safest years ever recorded for General Aviation. FAA's goal is to reduce general aviation fatal accidents over the next ten years from this baseline to no more than one accident per 100,000 flight hours.

Performance Overview

The FAA met the target in FY 2008 for reducing general aviation fatal accidents with fatal accidents involving rotorcraft showing especially sharp improvements. When looking at the trend line of the last ten years, FAA has continued to trend in the right direction. However, since GA accidents tend to fluctuate from year to year, the downward trend is not smooth. It is also important to note that since the agency began using General Aviation Fatal Accidents as a performance target seven years ago, the ceiling has been exceeded only once.

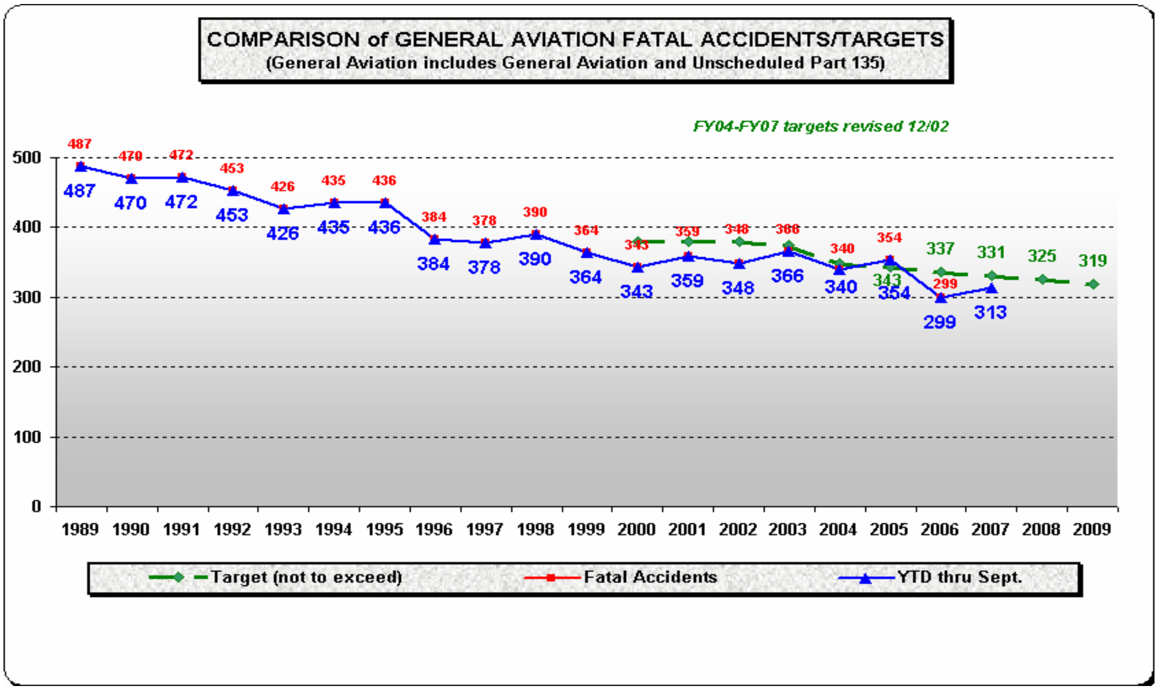
In FY 2008, FAA redefined the measure from the number of general aviation fatal accidents to a fatal accident rate. To set the target for the new rate, in FY 2007, the agency conducted the annual survey of GA aircraft owners. Using the results of this and previous surveys, FAA developed statistically accurate rates based on actual activity throughout the United States.

Further, approximately 60 percent of runway incursions are due to pilot error and about 80 percent of pilot deviations occur in GA. The FAA's close regulatory relationship with commercial passenger and cargo operators has been successful in mitigating the risk and in the reduction of runway incursions. Efforts are currently underway to expand the education outreach for GA operations to match the agency's success for commercial aviation.

In recent years, FAA has focused on reducing aviation risks in Alaska, particularly those associated with GA. Aviation plays a vital role in Alaska, but the state's topography and weather present unique safety challenges to pilots. Reducing accidents in Alaska to no more than 99 per year by 2009 is the third objective listed under FAA's *Flight Plan* goal for increased safety. Like the General Aviation measure, this measure will be replaced by a rate per flight hours in FY 2010.

FAA works with various members of the GA community, including aeromedical evacuation, charter services, and other members of the community to promote education and training on night landings, weather, and other areas of concern.

Since 1989, there has been a significant improvement in the number of general aviation accidents. The FAA began measuring general aviation fatal accidents as a performance target in FY 2000. Since then the agency has met or exceeded the target every year with the exception of FY 2005. The graph below shows the result of industry-wide efforts to continuously improve the safety of general aviation.



The steady improvement of general aviation's safety record is the result of dozens of programs within all areas of GA, from pilot education and training, to better technology, to improved operating methods and practices, to a more complete body of knowledge learned during more than 100 years of flying.

Budget Request Justification

In the same way it supports commercial aviation, FAA creates a strong regulatory and oversight environment to support general aviation. All four appropriations: Operations, F&E, AIP, and R,E&D, fund vital parts of this work. Since the majority of aviation fatalities are related to general aviation, reducing their number is a top priority for FAA.

In FAA's complex, interrelated system, all FAA organizations play a role in preparing general aviation aircraft for safe takeoffs, with AVS, ARP, and ATO taking the lead. Their major responsibilities are described on page 10 in the Commercial Safety Section.

General Aviation Safety

PREPARING FOR FLIGHT
Aviation Safety Organization
Office of Airports
Air Traffic Organization

GA in the United States is one of the world's safest forms of public transportation. Part of that outstanding track record comes from the steady improvements in technology and certification standards that have made GA safe for those flying and those on the ground. The following table outlines the contents of the Preparing for Flight segment of the GA section.

GENERAL AVIATION PREPARING FOR FLIGHT		
Aviation Safety Organization (AVS)	Office of Airports (ARP)	Air Traffic Organization (ATO
Aviation Safety Services – Air Carrier, Equipment, & Personnel	Establish and Maintain Airport Infrastructure	Provide Pilot Services

Aviation Safety Services – Air Carrier, Equipment and Personnel

(Operations, Aviation Safety, $175.4 million, 1,060 FTE)

General aviation flying is the gateway to commercial aviation. Just as in commercial aviation, GA pilots, aircraft, and organizations must be given an FAA approval and certificated in order to fly. The agency oversees more than 675 U.S. pilot training schools and centers. Instructors must be recertified every other year to renew their flight instructor certificate. Pilots are also required to obtain a medical certificate from an authorized FAA aviation medical examiner.

As is the case with commercial aircraft, new GA aircraft must receive FAA certification. There is an even greater variety in the GA class of aircraft than in commercial aviation; over 850 different types of GA airplanes and helicopters hold FAA certificates, as well as 179 other GA aircraft categorized as airships, balloons, and gliders. For new-generation GA aircraft, the agency has partnered with industry to develop new FAA-Industry Training Standards (FITS) that assure pilots are trained to fly technically advanced aircraft.

Unmanned Aircraft Systems (UAS) Staffing - Discretionary Increase

(Operations, Aviation Safety, $1.8 million, 10 FTE)

The 20 positions (10 FTE) will support increased demand for UAS access to the National Airspace System (NAS) for research, testing, and development of unmanned aircraft systems. The FAA is working to develop airworthiness requirements and to expedite the airworthiness approval process. The Aviation Safety Aircraft Certification Service (AIR) plans to establish a government-industry forum to develop consensus for technical and regulatory standards for future UAS design approvals. The demands for UAS government/industry access include: DOD mission training, DHS border/port patrol and off-shore surveillance, Department of Commerce environmental and atmospheric monitoring/surveillance and other emerging commercial and public-use applications for agricultural, pipeline, and maritime monitoring/surveillance, as well as aerial surveying and photography.

General Aviation Safety

(Continued)

GENERAL AVIATION PREPARING FOR FLIGHT		
Aviation Safety Organization (AVS)	Office of Airports (ARP)	Air Traffic Organization (ATO
Aviation Safety Services – Air Carrier, Equipment, & Personnel	Establish and Maintain Airport Infrastructure	Provide Pilot Services

Establish and Maintain Airport Infrastructure

(Grants-in-Aid for Airports, Office of Airports, $826.6 million, 63 FTE)

The agency places special emphasis on AIP investments aimed at reducing accidents in Alaska for GA and all Part 135 operations. This funding will support the continued improvement of rural airports by targeting up to 20 substandard airports through 2010, and requiring infrastructure development to permit access by essential medical emergency aircraft. In addition to this program, many of the airport activities described previously in the Commercial Air Carrier Fatality Rate section also support GA in Alaska and in other regions throughout the country.

Discretionary Increase Request:
Private Airport Data Collection (Grants-in-Aid for Airports, Office of Airports, $300,000, 0.0 FTE)

ARP requires $400,000 for a contractor to initiate a program to collect airport data from private airports. There are over 14,000 private airports and the data for these airports is very outdated. The contract would allow us to update two states per month. The updates are important because the private airports are charted and pilots need to know accurate information in the event they may need to make emergency landings at the closest airstrip.

Provide Pilot Services

(Operations, Air Traffic Organization, $1.1 billion, 4,689 FTE)

Many pilots of general aviation aircraft fly by visual flight rules (VFR). These pilots are not required to file flight plans and are only provided services by ARTCCs as time and workload permit. Flight Service Stations (FSS) and Automated Flight Service Stations (AFSS) are the agency's primary air traffic facilities that provide flight services to VFR pilots. The AFSS are a network of facilities across the U.S. operated by the FAA. These stations are part of FAA's air traffic system and are staffed by uniquely trained air traffic control specialists. The primary role of an AFSS is to provide weather briefings and flight planning services to pilots. The AFSS also coordinates VFR search and rescue services, provides orientation services to lost aircraft, maintains continuous weather broadcasts on selected navigational aids (NAVAIDs), and issues and cancels Notices to Airmen (NOTAMs).

There are various methods to obtain a required preflight pilot weather briefing. Pilots may call an FSS, use the Telephone Information Briefing System, or use the Direct User Access Terminal System (DUATS) all provided and funded by FAA. DUATS allows the pilot automated access to weather and aeronautical information through a personal computer at home, at the office, or at a fixed-based operator. Pilots may also pay a weather vendor to provide weather and aeronautical information for the preflight weather briefing.

Since October 4, 2006, flight services in the continental U.S. (CONUS), Hawaii and Puerto Rico have been provided by Lockheed Martin and funded by FAA through an A-76 performance-based contract. Alaska flight services were not a part of the A-76 contract process – three AFSS and 14 non-automated FSS remain government operated. The FAA plans to implement the Alaska Flight Service Modernization (AFSM) program to ensure Alaska's unique aviation needs are satisfied by providing service on par with the service available in the CONUS, Hawaii, and Puerto Rico; to expand and enhance flight services throughout Alaska through innovative use of remote airport advisory cameras and the delivery of information via Internet website hosted on kiosks located at rural airports; and to provide productivity increases and reduce operational costs. Enhanced automation has been implemented in Alaska to resolve information security and data integrity issues.

The urgency to modernize flight service in Alaska is warranted because Alaska's skyways are equivalent to the highway and road infrastructure found throughout the CONUS, making the use of general aviation aircraft essential to everyday life. This includes, but is not limited to, enabling children to attend school, traveling to medical appointments, and supplying communities with groceries, fuel, and mail.

Using existing human resources, Flight Services in Alaska has developed and implemented a pilot safety initiative aimed at reducing general aviation accidents in the state. This initiative uses the knowledgeable and experienced controller workforce of Alaska's Flight Services to interact directly with pilots to communicate tips and best practices on the use of the FSS to improve the safety of the flight.

General Aviation Safety

FLIGHT
Aviation Safety Organization
Air Traffic Organization

The table below provides a brief outline of the following information focused on GA, Flight.

GENERAL AVIATION FLIGHT	
Aviation Safety Organization (AVS)	Air Traffic Organization (ATO)
Aviation Safety Services – Air Carrier, Equipment, & Personnel	Provide Pilot Services

Aviation Safety Services – Air Carrier, Equipment, and Personnel

(Operations, Aviation Safety, $175.4 million, 1,060 FTE)

As with commercial aviation, continued operational safety oversight is the most critical part of the agency's safety responsibility for GA. The FAA must maintain the safety of the current system and its users—people, equipment, and organizations—before the agency can allow new users to enter the system.

Many FAA personnel are assigned to work in both the commercial and GA arenas. Similar to commercial aviation, the agency issues Airworthiness Directives (AD) and uses the Aircraft Certification Systems Evaluation Program to help oversee the GA community. In addition, the same group of designees enhances FAA oversight resources.

Many general aviation aircraft never enter FAA-controlled airspace. These pilots can experience greater freedom and greater challenges and therefore carry greater responsibility than their commercial aviation counterparts. Many pilots fly solo and lack the access to resources for training, emergency procedures, equipment, and corporate policy available to their commercial aviation counterparts. These factors, as well as the use of smaller aircraft, help contribute to general aviation fatal accidents. The agency continues to work with the GA community to drive down the number of fatal accidents.

Weather is one of the primary causes of GA fatalities. A pilot operating under VFR may take off in clear skies, but weather or visibility can turn bad unexpectedly during flight. For this reason, providing pilots with accurate and current weather information through pre-flight weather briefings, as well as through technology in the cockpit, is a high priority.

In addition, since 2000, the agency has used a safety risk management approach to enhance GA safety. This initiative is a risk-management approach to enhanced safety. The FAA also draws on the benefits of satellite technology, which helps pilots navigate more precisely and safely.

General Aviation Safety
(Continued)

FLIGHT
Aviation Safety Organization
Air Traffic Organization

GENERAL AVIATION FLIGHT	
Aviation Safety Organization (AVS)	Air Traffic Organization (ATO)
Aviation Safety Services – Air Carrier, Equipment, & Personnel	Provide Pilot Services

Provide Pilot Services

(Operations, Air Traffic Organization, $1.1 billion, 4,689 FTE)

During flight, a pilot can request weather updates or other support from the FSS. If the pilot becomes disoriented or lost during a flight, he can contact a FSS controller by radio for assistance. Further, if a pilot is in an emergency situation and needs to make an unscheduled landing, the controller in the FSS can either assist the aircraft or contact the controlling ATC facility for assistance.

Upon nearing the landing airport, the pilot contacts the control tower by radio and requests landing instructions. The tower controller provides the pilot with information regarding other airplanes in the area and with approach, landing, and taxi instructions. At non-towered airports or during hours when the control tower is closed, a pilot can request advisory services from select FSS.

The Alaska Flight Service Modernization (AFSM) program is currently working through the AMS program to ensure parity of flight services in Alaska with the level of service available in the CONUS, Hawaii, and Puerto

Rico; to expand flight service accessibility throughout Alaska; and to provide productivity increases and reduce operational costs.

POST FLIGHT
Aviation Safety Organization

General Aviation Safety

This last phase of general aviation flight is focused on the activities of AVS and ATO in support of post-flight safety. The table below provides a snapshot of the content.

GENERAL AVIATION POST-FLIGHT	
Aviation Safety Organization (AVS)	**Air Traffic Organization (ATO)**
Aviation Safety Services – Air Carrier, Equipment, Personnel	**Provide Pilot Services - WAAS for GPS**

Aviation Safety Services – Air Carrier, Equipment and Personnel

(Operations, Aviation Safety, $175.4 million, 1,060 FTE)

Like commercial aviation, GA safety is a continuous loop — establishing safety standards and policies; ensuring all aviation personnel, organizations, and equipment meet these standards; performing ongoing risk analyses and evaluations; and putting improvements in place — all in an effort to avoid the causes of accidents before they occur.

However, when accidents or incidents do occur, the agency ensures that it learns from them. The agency investigates almost every GA accident. FAA also collaborates with the GA community on the GA Joint Steering Committee to target resources where they can bring the greatest benefit. The group is focusing on the biggest accident causes — weather, controlled flight into terrain, and aeronautical decision-making. For all of these, pilot education is essential, which is why the agency is stepping up its pilot education efforts through a revitalized Aviation Safety Program. In addition, dedicated websites generate e-mail update notices to pilots and provide information on temporary flight restrictions and other notices.

Provide Pilot Services - WAAS for GPS

(Facilities and Equipment, Air Traffic Organization, $97.4 million)

The WAAS program for GPS is the first navigation aid capable of providing vertical guidance, or three dimensional guided instrument approaches, to pilots during all phases of flight, in all weather conditions at all locations throughout the NAS. The FAA has identified WAAS as a "Contributor" program for NextGen providing Broad-Area Precision Navigation. In addition to the overall safety gains, WAAS enables feeder airports to have reliable landing capability in all weather conditions. This capability is an important contributor to NextGen as it enables scheduled transport operations for regional carriers from feeder airports to major hub airports.

WAAS, a satellite-based navigation technology allows any qualifying airport in the NAS to have vertical and horizontal guidance without expensive legacy navigation hardware installed at each runway. WAAS continuously broadcasts a GPS-like signal from space for horizontal and vertical navigation across the NAS. The WAAS messages are broadcast to users' receivers via leased navigation transponders on two commercial geostationary (GEO) satellites. FY 2010 funding will address ground system sustainment, satellite costs, and avionics development. FAA is continuing to develop WAAS to expand the precise horizontal and vertical guidance capability to 100 percent of the 48 contiguous states and to most of Alaska. This funding includes activities essential to sustainment of the WAAS system. FY 2010 is the second year with funds specifically allocated to technology refresh which includes subsystem replacement and communication upgrades. WAAS is a commercial off-the-shelf (COTS) based system. The baseline architecture requires on-going hardware and software refresh involving evaluation of component reliability and obsolescence, determination of replacement components, hardware and software development, and integration and test into the overall system. The total cost of technology refresh activities is $11.7 in FY 2010.

Performance Measure
Prevent Fatalities, Injuries, or Damage to the Uninvolved Public from Commercial Space Launches

Section Organization

This section outlines the total budget request, presents an overview of commercial launch safety performance, and provides budget justification details. Unlike the previous two sections, this budget justification is organized to detail activities and programs that support all phases of flight.

Budget Request

This funding request contributes to the DOT Safety strategic goal. This resource request for $15.7 million will allow FAA to maintain its record of zero fatalities during commercial space launches.

It supports maintaining FAA's *Flight Plan* target of Zero Commercial Space Launches involving fatalities, serious injuries, or significant property damage to the uninvolved public. While this is not a DOT-level performance outcome goal, it is included here to emphasize FAA's commitment to promoting safety in the rapidly developing commercial space industry. Table 9 displays performance history and targets. Table 10 shows the resources required to maintain this record.

Table 9. Number of commercial space launches causing a fatality, serious injury, or significant damage to the uninvolved public

Commercial Space Launch Accidents[1]: Number of accidents resulting in fatalities, injuries, or significant property damage to uninvolved public						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	0	0	0	0	0	0
Actual	0	0	0	0	N/A	N/A

1 FAA *Flight Plan* target. Although not designated a DOT-level measure, Commercial Space Launch Accidents is included to emphasize FAA's commitment to promoting safety in the rapidly developing commercial space industry.

Table 10. Budget Request for Commercial Space Safety Goal

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	**FY 2008 ACTUAL**	**FY 2009 ENACTED (OMNIBUS)**	**FY 2010 REQUEST**
Safety			
Zero Commercial Space Accidents			
Operations	13,280	15,007	15,714
Total	**13,280**	**15,007**	**15,714**
FTE	**59**	**71**	**73**

Performance Overview

The FAA's Associate Administrator for Commercial Space Transportation (AST) conducts a variety of activities to ensure the protection of the public, property and the national security and foreign policy interests of the United States during commercial launch or reentry activities and to encourage, facilitate, and promote U.S. commercial space launch transportation. This is accomplished by guiding the commercial space transportation industry through the regulatory process; evaluating license and/or permit applications; inspecting launch and/or site operations; evaluating proposed operational plans; supporting environmental reviews; and conducting special studies related to commercial space transportation.

The FAA has overseen 195 licensed launches and 20 experimental permit flights through March 2009 and has maintained a safety record that includes no third party casualties or property damage. Licensed commercial launches increased from 4 in FY 2007 to 11 in FY 2008. Factors contributing to this increase include the return to flight of Sea Launch and increased launch activity of SpaceX. AST estimates revenues of $640 million to launch operators in FY 2008.

The licensing and permitting processes are a major reason for FAA's sterling commercial space transportation safety record. The agency currently has 18 active licenses - 12 for launching expendable launch vehicles (ELV) and 6 for operating launch sites; and 3 active permits.

The Commercial Space Launch Act provides the agency authority to license both launch operations and launch site operations. In addition, the Commercial Space Launch Amendments Act (CSLAA) of 2004 authorizes the issuance of experimental permits for suborbital RLV operations and provides for human space flight on commercial launches. The CSLAA promotes entrepreneurial and technological growth and development. It facilitates market entry and provides an opportunity for smaller companies with less experience and fewer resources than the major industry players, to first develop and test without having to meet the more rigorous standards of the licensing process.

AST recognizes the multitude of airspace management challenges brought on by space operations and is leading an initiative to safely integrate increasingly complex space launch operations into the NAS. This initiative is the Space and Air Traffic Management System (SATMS), which in part requires that licensed and permitted launch operators, especially those at non-federal launch sites, coordinate their activities with the air traffic region responsible for managing the launch or reentry airspace.

The agency works closely with the Commercial Space Transportation Advisory Committee (COMSTAC) on issues of importance to the launch industry. The agency also conducts activities in partnership with various space organizations and state associations, including the Aerospace States Association (ASA), the Aerospace Industries Association (AIA), American Institute of Aeronautics and Astronautics (AIAA), and the Satellite Industry Association (SIA). The ASA has taken a lead role not only in coordinating with states that are operating and developing new launch sites, but in fulfilling the need for a broad national vision for commercial space transportation. The AIA has made revitalizing the aerospace workforce and industrial base among its top priorities.

In August 2006, NASA awarded Space Act Agreements under what is referred to as the COTS (Commercial Orbital Transportation Services) program to provide funding over a four year period to selected developers to develop and demonstrate the vehicles, systems, and operations needed to re-supply, return cargo from, and transport crew to and from the International Space Station. Because the COTS demonstrations are conducted by participants, not NASA/U.S. Government, the participants need to obtain either licenses or permits from FAA.

In December 2008, NASA awarded two Commercial Resupply Services (CRS) contracts for the purchase of orbital support services from two commercial launch providers; SpaceX and Orbital Sciences Corporation. These two contracts call for up to 12 commercial launches from SpaceX valued at $1.6 billion, and up to 8 launches from Orbital Sciences Corporation valued at $1.9 billion. All activities purchased under these contracts will be FAA licensed launch activities. Additionally, Orbital Sciences plans to launch their vehicles from the Wallops Island launch facility, marking a major break from past launch activity which relied heavily on Air Force support at the Eastern and Western Ranges. The level and scope of the contracted activity, as well as the addition of new launch sites, will place significant new burdens on AST.

Since the beginning of the program in FY 2006, FAA has been participating in COTS activities to facilitate the licensing process. Such participation has included systems requirements reviews, preliminary design reviews, critical design reviews, and discussions around launch/landing site issues. The COTS program has provided AST with its first opportunity to exercise the reentry regulations promulgated in September 2000, and to make a reentry determination. The FAA is anticipating the initial launches and reentries for this program to commence early in 2010.

In addition, FAA provides publications, data, and events to industry that focus attention on the commercial space sector and the business opportunities it affords. In 2008, FAA's Commercial Space Transportation organization co-hosted with the U.S. Air Force (USAF) the third annual summit attended by RLV entrepreneurs. The summit provided a forum at which the USAF presented its space transportation needs and the RLV entrepreneurs communicated their capabilities. At the summit, the Air Force committed to investigate, evaluate, and where possible incorporate commercial space transportation technology into Air Force development efforts. Air Force Space Command held a series of round table discussions and one-on-one meetings with industry hosted by a General Officer to identify ways to incorporate emerging technology outside the traditional requirements process and reduce the contracting burden for small firms. AST also conducts an annual forecast conference for the benefit of the industry.

Budget Request Justification

This funding request will allow FAA to further promote safety in the rapidly developing commercial space industry.

License, Permit, Inspect, and Support Industry Development

(Operations, Commercial Space Transportation, $14.7 million, 70 FTE)

The commercial space transportation industry continues to evolve and advance technologies in a business climate that offers unprecedented challenges. Companies developing RLVs are committed to the goals of safely operating their vehicles, reducing the cost of access to space, and providing new opportunities for space travel by paying passengers. Further, the CSLAA provides a stepping-stone to enhance both research and development and human space flight. The emerging human space flight segment also joins the ELV and evolved expendable launch vehicle (EELV) markets.

Casualties to the uninvolved public and damage to uninvolved property during commercial space transportation activities are prevented and risk is reduced through the agency's continual development and enforcement of commercial space transportation regulations, safety evaluations of proposed licensed or permitted activities, and monitoring and inspection of launch safety related activities. A launch or reentry accident involving the public could be catastrophic to this evolving industry. Given adequate resources to support licensing, permitting, and inspection programs, FAA can promote safety and encourage growth in commercial space. Reducing resources that support the commercial space workforce has the potential to adversely impact safety, long-term industry support and development.

License and Permit Determinations

AST issues licenses to establish launch services providers, new entrants to the market, and to operators of launch and reentry sites. AST also issues permits for test flights of suborbital reusable rockets to obtain technical data that could be used to satisfy license requirements.

The licensing and permitting processes for vehicle developers are accomplished in phases. For launches, the components of the licensing process includes pre-application consultation, policy review and approval, safety review and approval, payload review and determination, financial responsibility determination, and an environmental review. Pre-application consultation is accomplished prior to the formal submittal of a license or permit application. Compliance monitoring is performed after the license or permit has been issued.

Since the enactment of the CSLAA, interest in experimental permits has increased significantly. The purpose of experimental permits is to allow developers to test new suborbital reusable rocket design concepts, new equipment, or new operating techniques; show compliance with requirements as part of the process for obtaining a license; or conduct crew training using the planned launch or reentry vehicle rocket design, prior to obtaining a license.

The CSLAA regulations governing experimental permits and human space flight were completed in FY 2007. Experimental permits are issued for periods of one year and allow for an unlimited number of flights. Depending on the launch operator's plans, an experimental permit may be an interim step to a full license.

While the legislation recognizes the inherent risk in space flight and provides that participants assume some risk engaging in it, the agency's regulatory regime for permitted operations continues to provide for the safety of the uninvolved public.

Human space flight adds a complicating dimension to permit and license evaluations. Pilots and some crew members are part of a vehicle's flight safety system. Unlike mechanical or automated systems, human reactions during flight present unique challenges during the safety evaluation process. The issuance of an experimental permit does not require a quantitative risk analysis. However, for a launch license, risk analyses are required as part of the license determination. This creates a new challenge since the introduction of humans as part of the flight safety system is not easily quantifiable. Human space flight also adds other factors to consider in the determination, such as the level of training required and the physical condition of the crew to ensure safety to the uninvolved public. While the only licensed flights to date involving humans were conducted in Scaled Composite's SpaceShipOne, several companies have conducted test flights under the experimental permit regime and have announced plans to conduct test flights under a permit with crew in 2010 or 2011.

The launch site operator or reentry site operator license application process includes an interagency review to ensure foreign policy, national security, and international obligations are addressed. The safety evaluation focuses on launch and reentry site suitability, security, scheduling, notifications of local agencies, record keeping, lightning protection, the storage and handling of propellants and explosives, and an environmental review.

Safety Inspections

Safety inspections contribute significantly to AST's ability to verify licensees and permitees remain in regulatory compliance and continue to operate safely and to the attainment of FAA's safety goal. AST performs safety inspections of licensed and permitted operators that include activities at launch and reentry sites, and at manufacturing facilities to ensure activities do not adversely affect the safety of a launch or reentry operation. The purpose of safety inspections is to make certain that the licensee or permittee is conducting activities in accordance with 1) the regulations, 2) the representation made in the application materials presented to AST, and 3) the terms and conditions of the license or permit.

With greater oversight responsibilities at federal launch ranges and increased vehicle complexity, FAA anticipates more than one inspection will be performed for each licensed operator. Some inspections will occur during preflight activities leading up to launch and could also include activities during the launch itself and at manufacturing facilities. The FAA expects to conduct 44 inspections of licensed and permitted launch operations during FY 2010. The agency currently conducts at least one inspection of launch site operations per year at each site and anticipates conducting seven site inspections in FY 2010.

Support Industry Development

The commercial dimension of U.S. space activity is evident in the growing list of existing non-federal launch sites as well as in the number of proposed inland commercial launch sites. Organizations in several states see the potential of spaceports to accommodate future launch vehicles and are actively working to turn their spaceport visions into reality. Site operators are also seeking new opportunities such as payload processing and space research facility development. These conditions require the agency to embrace the operational and technical complexities of the U.S. commercial space transportation industry and to facilitate greater recognition of the industry in the U.S. economy and to manage resources to optimize results.

Another direct result of the 2004 CSLAA legislation has been a surge in planning for human space flight. Several companies are implementing plans to provide the public with the means to get to space within the 2009 or 2010 time frame. In October 2008, the X-Prize Foundation sponsored its third X-Prize Cup competition at which Armadillo Aerospace won the first level competition, garnering a $350,000 NASA-sponsored prize. The annual event gathers many companies and/or teams to compete in space-related events, several of which require vehicle flights. The conditions of many of those competitions require the competitors to have licenses or experimental permits for their vehicle operations. In addition to working with the foundation to coordinate safety for the event, the competition creates a recurring permit evaluation and subsequent safety inspection workload for AST.

The recognition that the commercial space transportation industry is on the cusp of an increase in growth has several states and transportation authorities seeking information about the establishment of launch and reentry sites. They recognize the future economic benefits for a locality with these assets. While several communities have publicly made pronouncements of intentions to establish spaceports, three locations, including one inland site, are currently in discussions with AST.

Recognizing that space transportation inherently transcends international boundaries, AST has taken the lead in identifying, assessing, and resolving the issues arising from the development of commercial space transportation. AST has developed a comprehensive international outreach program to identify nations and organizations with a stake in the development of safe, efficient commercial space transportation and to implement ways to cooperatively address common safety, operational, and airspace integration issues. AST works with the international community to develop common approaches to shared problems. In doing so, AST seeks to provide the emerging industry a fair and open international operating environment and the means to grow and develop with the right amount of regulation while keeping all doors to growth open.

By cooperating with interested US government agencies to develop this roadmap, AST is working to ensure a solid foundation for nurturing a healthy and competitive space transportation industrial base. In support of this effort, AST has sponsored a Human Spaceflight Safety Committee under the auspices of the International Astronautical Federation. This platform will provide a highly-respected forum from which to promulgate US interests, regulatory philosophy, and rule-making products to the rest of the world while seeking international understanding and acceptance. These dual tracks will provide AST the opportunity to assume international leadership in an area of critical concern to the U.S. technological, national security, and industrial bases.

AST recognizes the rapidly changing space transportation market, which includes the commercial manned spaceflight market, offers significant new challenges to the regulator. As AST addresses the critical issues of manned spaceflight safety and the new vehicles and technologies which will support it, AST understands the increased requirement for research and development to support sound regulatory guidance and evaluation. To this end, AST seeks to increase its capability to identify and research essential issues to provide the foundation for sound rulemaking in commercial space transportation.

Moving forward, it is critical that the agency develops operational and vehicle rules that permit the industry to develop and grow while remaining internationally competitive. Among the challenges on the horizon, is the need to address the means to ensure safety of people and property throughout all phases of sub-orbital and orbital operations, including commercial manned spaceflight. This requires the integration of accurate and timely space surveillance information when operating outside of the traditional National Airspace System (NAS) in order to seamlessly integrate growing numbers of commercial space transportation operations transiting the NAS. This system must encompass the increased number of spaceflights, non-traditional commercial spaceports supporting research and development activities, and revenue-generating commercial space flights.

Performance Measure
Reduce the Number of Serious Hazardous Materials Incidents in Transportation

Chapter Organization

This chapter outlines the total budget request, presents an overview of hazardous materials and performance and specifies programs and related resource needs to support safety initiatives in FY 2010.

Budget Request

This funding request for approximately $24.5 million contributes to the DOT Safety strategic goal and to the Reduce Serious Hazardous Materials Incidents performance measure. The hazardous materials goal is a DOT target. The FAA shares responsibility with the Pipeline and Hazardous Materials Safety Administration (PHMSA), the Federal Motor Carriers Safety Administration (FMCSA), and the Federal Railroad Administration (FRA) for decreasing the number of serious hazardous materials incidents in transportation. Table 7 displays performance history and targets. Table 8 shows the resources required to maintain this record.

Table 7. Number of serious hazardous materials incidents [1]

Serious Hazardous Materials Incidents[1]: Number of serious hazardous materials transportation incidents (CY)						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	503	460	466	462	458	458
Actual	528	495	473	451[2]	N/A	N/A

[1] Targets and results are for DOT as a whole; FAA contributes.
[2] Preliminary estimate.

Table 8. Budget Request for Serious Hazardous Materials Incidents in Transportation Goal

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	**FY 2008 ACTUAL**	**FY 2009 ENACTED (OMNIBUS)**	**FY 2010 REQUEST**
Safety			
Reduce Hazardous Material Incidents			
Operations	20,893	23,700	24,512
Total	**20,893**	**23,700**	**24,512**
FTE	**142**	**147**	**149**

DOT is creating a risk-based performance goal to measure the effectiveness of its hazardous materials program. This new goal will examine the effectiveness of DOT's regulations, inspections, and outreach in changing practices and lowering risk in the hazardous materials industry.

Performance Overview

Hazardous materials pose a serious accident risk for aircraft. Hazardous materials incidents, the unintended release of hazardous materials, occur most frequently in commercially shipped cargo. The best-known case of an accident related to hazardous materials was the 1996 ValuJet crash. In that case, improperly handled oxygen containers ignited, causing the airplane to crash, killing all passengers and crew aboard. Since that time, the agency has reemphasized vigilance in the prevention of hazardous materials incidents.

The FAA's Assistant Administrator for Security and Hazardous Materials (ASH) is responsible for the safe transportation of hazardous materials in air commerce. ASH develops and implements national policy on hazardous materials through inspections, training, and outreach to those involved in the production and transportation of hazardous materials worldwide.

Aviation-specific program performance targets are currently being met. In recent months, the air transport of batteries has been identified as a serious accident risk for aircraft. Since 1999 there have been approximately 98 reports of various types of batteries in air cargo or passenger baggage that have caused fires. During 2006 and 2007 the U.S. Consumer Products Safety Commission announced the recall of over 10 million lithium batteries which have been found to ignite when heated during simple use. To reduce this risk FAA has been working with the Pipeline and Hazardous Materials Safety Administration to strengthen the hazardous materials regulations that apply to battery shipments. In response to battery-specific safety recommendations by the National Transportation Safety Board, efforts are underway to work with airport operators to create a set of hazmat safety announcements for passengers.

Budget Request Justification

The following section describes the major activities supported by this budget request. The flight structure used in other sections has not been continued here, as this program affects all phases of flight.

Manage Hazardous Materials

(Operations, Security and Hazardous Materials, $ 22.9 million, 142 FTE)

Since 1977, the Secretary of Transportation has delegated the enforcement of regulations governing transportation of hazardous materials by air and the investigation of hazardous materials incidents to FAA. In 2008, the latest full year for which data is available, FAA opened over 2,200 hazardous materials investigations and closed 490 such investigations with civil penalty sanctions totaling over $12.1 million. The FAA expects to complete over 9,000 inspections in FY 2010. The agency also expects to open 3,000 hazardous materials investigations in FY 2010.

Technical training for hazardous materials inspectors is another key component of the program's success. ASH conducts an annual analysis of training needs for this function. Courses are currently offered for new inspectors, and refresher and advanced training opportunities are provided to seasoned hazardous materials inspectors.

In March 2006, GAO issued an audit report entitled Undeclared Hazardous Materials, New DOT Efforts May Provide Additional Information on Undeclared Shipments (GAO-06-471). The results of this report indicate that while DOT and DHS play complementary roles in efforts to discover undeclared hazardous material, neither can provide data about the amount of undeclared hazardous materials entering or discovered entering the country, even though their subordinate agencies maintain inspection databases.

PHMSA has deployed an intermodal database that contains all the Department's hazardous materials inspection, incident, permit, penalty and registration information. This Hazmat Intelligence Portal allows FAA hazardous materials inspectors to access relevant background information for the regulated parties they visit.

Core hazardous materials responsibilities have changed as the result of Congressional and Administration direction. In 2003 DOT's PHMSA and the Research and Innovative Technology Administration (RITA) issued an interpretation that makes airline passengers subject to hazardous materials regulations while being screened by security personnel. The requirement to screen one hundred percent of checked baggage continues to greatly increase the workload of the TSA screening agent and FAA's hazardous materials organization. When screeners suspect hidden hazardous materials in checked luggage, they notify the air carrier. If it actually is unauthorized hazardous materials the air carrier must notify the agency. The FAA receives on average 1,000 baggage reports each month.

Reported hazardous materials discrepancies increased from approximately 1,000 in 1998 to over 12,000 in 2008. In response, the agency has deployed new automation tools to process many of these findings. For example, FAA has deployed a web-based data entry tool to support inspectors in documenting air carrier reports of hazardous materials discrepancies. The agency has also developed a computerized system that generates educational awareness letters to passengers found to be carrying less serious hazardous materials. For commercial shippers, the agency will continue to develop and use the DOT-wide hazardous materials information-sharing database to score shipping companies for level of risk. This risk information assists the agency in targeting companies to visit and is used to prioritize inspections to ensure efficient use of limited resources.

However, the more serious hazardous materials in checked and carry-on baggage will be individually investigated. In addition, while commercial shipper incidents are declining, passenger incidents are increasing. Based on those factors, the agency plans to increase its outreach efforts to better educate the public during FY 2010.

In FY 2010 ASH will implement a pilot program in coordination with the FAA's Safety Office (AVS) and its Flight Standards Service to prototype use of the agency's Air Transportation Oversight System (ATOS) for hazardous materials inspections of U.S. air carriers. The program is designed to collect and manage data in a systematic way so that trends and risks can be identified and resources targeted more appropriately. The hazardous material information developed will be electronically shared and evaluated by both ASH and AVS.

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REDUCED CONGESTION

Introduction

The Next Generation Air Transportation System (NextGen) will continue to address today's constraints and comprehensively modernize and transform the air transportation system. The FAA is committed to further improve safety, increase capacity, and reduce congestion and aviation's environmental impact in order to better accommodate traffic growth and to support the economic viability of those who use the system, now and in the future.

Over the past year, FAA has begun funding the development and implementation of NextGen technologies and procedures. In FY 2008, the FAA aligned its internal NextGen planning and implementation under one office in the Air Traffic Organization (ATO), headed by the Senior Vice President for NextGen and Operations Planning. This office serves as the key decision-making venue for ensuring that FAA's NextGen commitments lead to NextGen transformation. It enables coordination among the various FAA lines of business and coordinates collaboration across the aviation community, with airlines, cargo carriers, general aviation, airports, local communities, and manufacturers.

The complexity of the future operating environment – with evolving fleet mixes, new aircraft, technology, and environmental constraints – must be approached in partnership with FAA stakeholders. The multi-agency Joint Planning and Development Office (JPDO) is charged with developing the long-term vision for the air transportation system's transformation with the active participation of the DOT, FAA, NASA, DoD, DHS, Commerce, and the White House Office of Science and Technology Policy, along with numerous non-governmental stakeholders. JPDO reports to the FAA Senior Vice President for NextGen and Operations Planning.

NextGen integration and implementation is organized around three domains and their respective solution sets: air traffic operations, airport development, and aircraft and operator requirements. All three domains are critical to achieving the strategic goal of reduced congestion and must be approached interdependently considering the strategic research and development opportunities; safety, policy, and certification requirements; and development of key enabling programs and technologies. The greatest benefits will be realized through balanced progress on the airport surface, in the aircraft, and throughout the air traffic management system. The FY 2010 budget request supports those activities across the domains to achieve near-term deployment of mature technologies, develop moderately mature concepts for operational viability, and perform research to better define long-term capabilities.

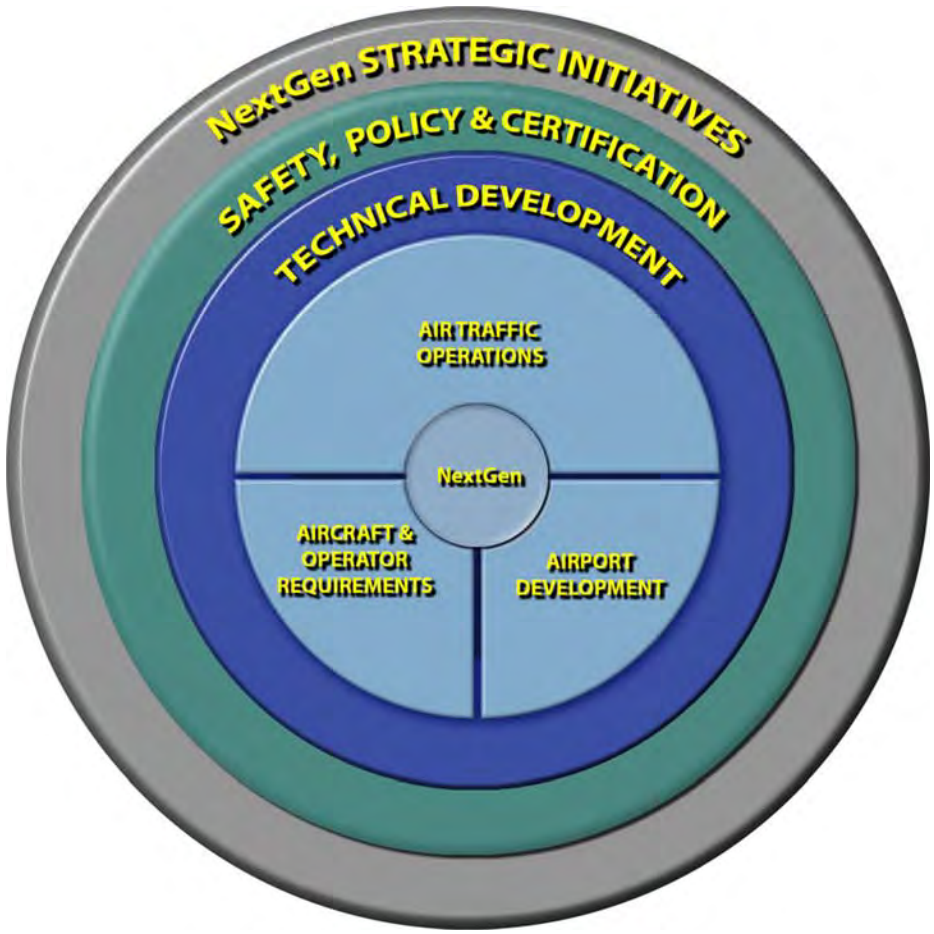
The request is performance-based and performance-driven. Airport development focuses on 15 metropolitan areas around the country that will be significantly capacity constrained by 2025 if no improvements are made. In addition to 14 major airports, this set includes 87 secondary and reliever airports at which improvements could be made in an effort to increase the capacity and efficiency of the metro areas. Achieving reduced congestion and meeting the future capacity needs of the nation's airports will require innovative approaches, including satellite-based procedures that allow for more direct routing, reduced separation, and reduced noise and emissions. Airport capacity improvements also include continued emphasis on airport expansion infrastructure, and new technology.

With NextGen, aircraft are expected to have a wider range of capabilities and support varying levels of total system performance via on-board capabilities and associated crew training. Many aircraft will have the ability to perform airborne self-separation, spacing, and merging tasks and precisely navigate and execute four-dimensional trajectories. Along with navigation accuracy, aircraft will have varying levels of cooperative surveillance performance via transmission and receipt of cooperative surveillance information. Aircraft without an on-board pilot (e.g., unmanned aircraft systems) will operate among regular aircraft. These aircraft capabilities represent a significant change in the aircraft's role and are critical to achieving reduced congestion. Most immediate benefits will come from leveraging and maximizing existing aircraft equipage. The FAA is targeting existing equipage and associated capabilities to maximize operational benefits in the near-term in locations and airspace that require a higher performance level in order to elevate system performance and to satisfy demand.

In the air traffic operations domain, the seven solution sets are aimed at enabling a broad range of NextGen capabilities. In the near term, our investments will address increasing throughput at the nation's busiest airport terminal areas; initiating separation management efforts to enable shifting from clearance-based control to trajectory-based; and providing the capability to dynamically change airspace and airports for greater capacity through flexible terminals and airports.

The importance of moving ahead on NextGen cannot be overstated. All elements of the air transportation system – air traffic, aircraft, and airports alike – must transform in order to achieve the NextGen vision. Concurrent development of NextGen technology is also vital. The FY 2010 budget submission is a critical step towards ensuring that our near-term portfolio of investments support achieving critical mid-term capabilities.

Figure 1. The Operational Evolution Partnership Plan (OEP)



Focus of OEP Domains and Transition Rings

Three core domains focus on FAA's implementation commitments:

- **Airport Development** targets capacity and delay reduction at both the 35 busiest airports and 15 metropolitan areas forecasted to experience significant population gains and economic growth over the next 20 years. With regard to the 35 OEP airports, the focus is on reducing delays and increasing capacity through building new runways and taxiways, major runway extensions, and airfield reconfigurations. Vis-à-vis the 15 metropolitan airports, the focus is on reducing delays and increasing capacity through airport expansion as well as regional and multi-modal planning efforts.
- **Aircraft & Operator Requirements** focuses on developing standards for an avionics equipage package that provides the new capabilities required by NextGen.
- **Air Traffic Operations** describes new operational capabilities centered on fundamental NextGen concepts.

Three transition rings represent the evolution of proposed initiatives, showing stakeholders our progress toward fully committing agency resources to implementing new operational capabilities.

Organization

This budget request focuses on DOT's two aviation performance measures under its Reduced Congestion strategic goal – reliable and on-time performance of scheduled air carriers and increased capacity for the 35 OEP airports to meet projected demand and reduce congestion. Narratives for both performance measures appear in the Performance Overview and Budget Request Justification section. The Budget Request Justification section is organized by the activities of Preparing for Flight, Flight, and Post-Flight.

Narrative sections contain parenthetical inserts that summarize resource requests. In this section, most inserts summarize the total resources for an organization or appropriation that are mapped to Reduced Congestion. For Facility and Equipment (F&E) and Research, Engineering, and Development (RE&D), the inserts show resources for selected individual programs.

For complete disclosure of IT funding directly supporting DOT objectives, please refer to the technology investments justifications in Section 3.

Table 1 summarizes the Reduced Congestion budget request. Table 2 provides the discretionary increase budget request by allocation. Exhibits IV-1 at the beginning of this section and II-3 in Section 2 provide additional details.

Summary Budget Request

The FAA requests $6.7 billion, or about 42 percent of the total FY 2010 request, to implement the OEP plan which will expand capacity and reduce congestion within the nation's aviation system. The request supports expansion of capacity on the ground, in the form of new runways, and the continued deployment of new technologies that allow more efficient use of existing system capacity.

During the formulation of this request, ATO undertook a review of its method for allocating resources to DOT goals, comparing previous budget submissions with its Business Plans. In order to better align its zero-based budget with its plans, the organization has made bookkeeping revisions to its goal allocations for FY 2010. ATO Technical Operations Service Unit shifted its allocation from the safety goal to capacity to more correctly embody their mission of maintenance and repair of the airport and airways facilities and equipment. This shift does not reflect actual changes from FY 2009 in ATO programs or priorities. They have no substantive impact on any activities associated with the goals.

Table 1. Total Reduced Congestion Budget Request

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2008 ACTUAL	FY 2009 ENACTED (OMNIBUS)	FY 2010 REQUEST	
Reduced Congestion				
Increase NAS On-Time Arrival Rate at the 35 OEP Airports				
Operations	137,444	137,279	1,500,097	*
F & E	326,434	281,115	209,029	
RE&D	30,891	44,296	50,110	
Subtotal On-Time Arrivals	**494,769**	**462,689**	**1,759,235**	
Subtotal FTE	**670**	**916**	**4,784**	
Increase Average Daily Airport Capacity for the 35 OEP Airports				
Operations	370,436	302,091	1,481,150	*
F & E	1,482,287	1,637,638	1,775,113	
AIP	1,674,558	1,644,730	1,638,041	
Subtotal Avg Daily Airport Capacity	**3,527,282**	**3,584,459**	**4,894,304**	
Subtotal FTE	**2,505**	**3,223**	**6,398**	
Reduced Congestion $ Total	**4,022,051**	**4,047,148**	**6,653,539**	
Reduced Congestion FTE Total	**3,175**	**4,139**	**11,182**	

* Changes for FY 2010 from FY 2009 levels are due to bookkeeping revisions in the ATO zero-based budget resulting from efforts to align business planing and budget goal allocation methods. These changes have no substantive impact on the requisite activities associated with this goal. For more information, see the Summary Budget Request Section above.

Table 2. Discretionary Increase Requests

	($000)	FTE
OPERATIONS		
Air Traffic Organization		
NextGen Staffing Increase	7,000	52.0
OPERATIONS TOTAL	***7,000***	***52.0***
GRANTS-IN-AID FOR AIRPORTS		
Airport Planning and Geographic Info. System Staff	80	0.5
AIP TOTAL	***80***	***0.5***
TOTAL	***7,080***	***52.5***

The DOT's Strategic Plan for Fiscal Years 2006–2011 laid the foundation for a new transportation model that is needed to support America's economy in future years. Among other things, the plan set out an innovative *National Strategy to Reduce Congestion on America's Transportation Network.* As a result, congestion reduction is integrated as a priority throughout all DOT programs.

Specific to FAA, the National Strategy targets the improvement and provision of a future funding framework by designing and deploying the Next Generation Air Transportation System – a modernized aviation system with greater capacity and less congestion.

Further, the Strategic Plan identifies as an outcome the ability to meet new and growing demands for air transportation services through 2025 and beyond. The plan continues to emphasize the importance of NAS on-time arrivals with an added focus on reliability. It also identifies a new goal focused on average daily airport capacity at the 35 OEP airports. The FY 2010 funding request supports the achievement of these capacity goals.

Performance Measure: Increase Reliability and On-Time Performance of Scheduled Air Carriers

This funding request contributes to the DOT Reduced Congestion strategic goal for the increase the NAS On-Time Arrivals performance outcome measure. NAS On-Time Arrival is the percentage of all flights arriving at the 35 OEP airports equal to or less than 15 minutes late, based on the carrier flight plan filed with the FAA, and excluding minutes of delay attributed by air carriers to severe weather, carrier action, security delay, and prorated minutes for late arriving flights at the departure airport. Table 3 shows targets and results for NAS On-Time Arrivals. Table 4, on the following page, provides the budget request for Reduced Congestion and Figure 2 shows the percentage of on-time arrivals for the period FY 2005 through FY 2010.

Table 3. Percentage of all flights arriving at the 35 OEP airports no more than 15 minutes late due to NAS-related delays. [1]

	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target:	87.40%	87.40%	87.67%	88.00%	88.00%	88.00%
Actual:	88.44%	88.36%	86.96%	87.29%	N/A	N/A

[1] For FY 2005, FAA modified this measure to adjust for delays beyond its control, i.e. those not resulting from NAS-related factors. Previously, delays attributed to severe weather, the air carrier, and security were counted.

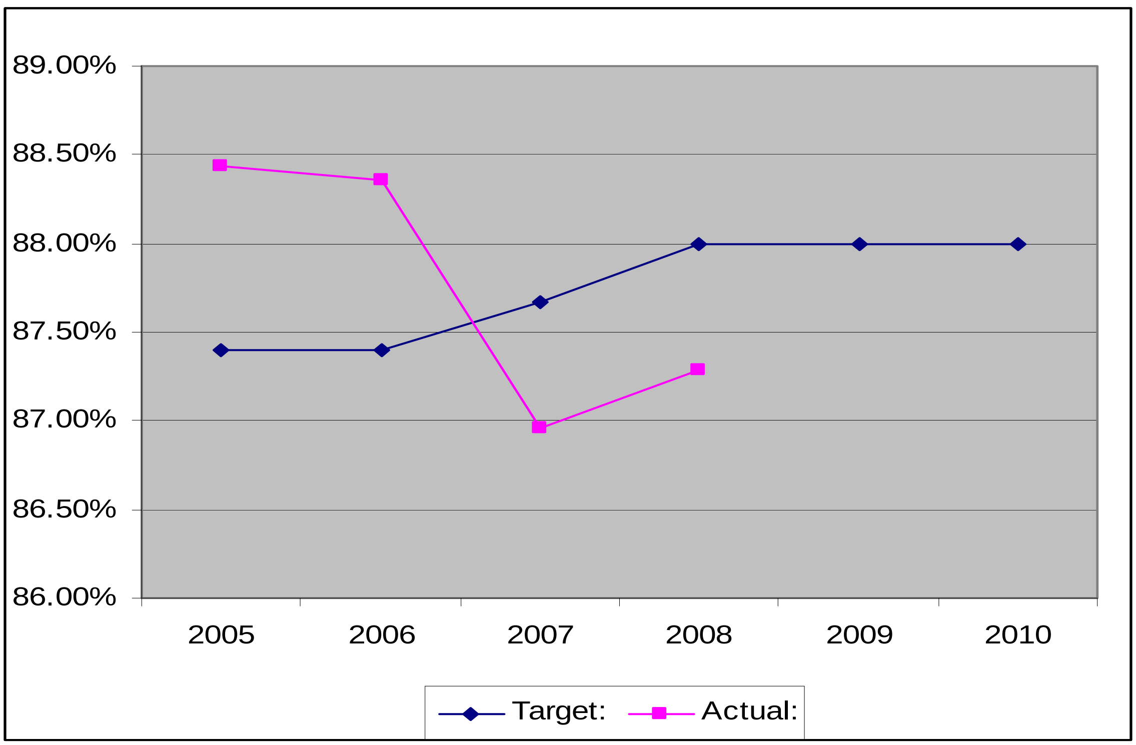
Table 4. Budget Request for NAS On-Time Arrivals

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2008 ACTUAL	FY 2009 ENACTED (OMNIBUS)	FY 2010 REQUEST	
Reduced Congestion				
Increase NAS On-Time Arrival Rate at the 35 OEP Airports				
Operations	137,444	137,279	1,500,097	*
F & E	326,434	281,115	209,029	
RE&D	30,891	44,296	50,110	
Total	**494,769**	**462,689**	**1,759,235**	
FTE	**670**	**916**	**4,784**	

* Changes for FY 2010 from FY 2009 levels are due to bookkeeping revisions in the ATO zero-based budget resulting from efforts to align business planing and budget goal allocation methods. These changes have no substantive impact on the requisite activities associated with this goal. For more information, see the Summary Budget Request Section for the Congestion goal on page four.

Figure 2. NAS On-Time Arrivals at the 35 busiest airports identified by the OEP.



Performance Measure: Increase Capacity for the 35 OEP Airports to Meet Projected Demand and Reduce Congestion

This funding request also contributes to the DOT Reduced Congestion strategic goal and to the increase capacity at the 35 OEP airports to meet demand and reduce congestion performance outcome measure. FAA calculates the performance outcome through the Average Daily Airport Capacity measure and seeks to achieve an average daily airport capacity for the 35 OEP airports of 103,068 arrivals and departures per day by FY 2011 and maintain through FY 2013. Average Daily Airport Capacity is the sum of the daily hourly-called arrival and departure rates at the relevant airports per month, divided by the number of days in the month. This is a dynamic measure, which changes daily based on factors such as weather and runway availability. The annual capacity level is the weighted sum of the monthly capacity levels.

While this is a new strategic goal for the DOT, FAA has focused attention on this goal area in the FAA *Flight Plan* since FY 2005.[2] Therefore, historic data are available and are presented below. Table 5 shows targets and results for Average Daily Airport Capacity at the 35 OEP airports. Table 6 provides the total budget request for this goal and Figure 3 on the following page shows the capacity trends for the period FY 2005 through FY 2009.

Table 5. Average Daily Airport Capacity Targets and Results at 35 OEP Airports

	2005	2006	2007	2008	2009	2010
Target:	99,892	101,191	101,562	101,868	100,707	102,648
Actual:	101,463	101,932	102,545	103,222	N/A	N/A

Table 6. Budget Request for Average Daily Airport Capacity at 35 OEP Airports

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2008 ACTUAL	FY 2009 ENACTED (OMNIBUS)	FY 2010 REQUEST
Reduced Congestion			
Increase Average Daily Airport Capacity for the 35 OEP Airports			
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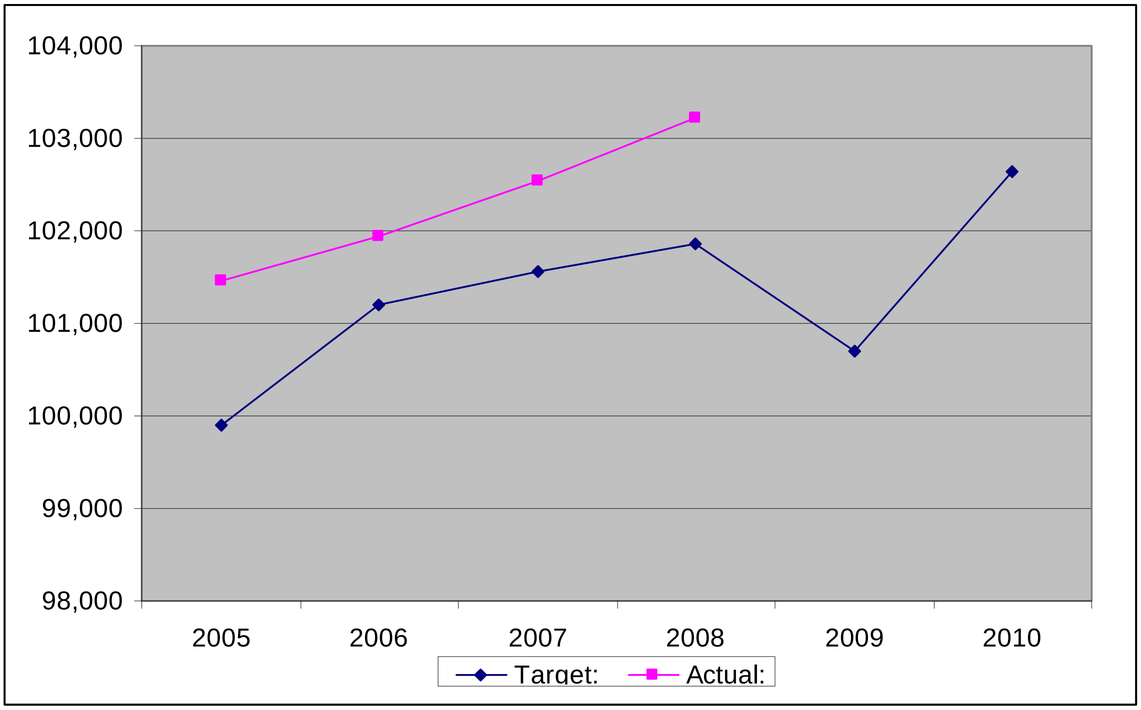
Total	**3,527,282**	**3,584,459**	**4,894,304**
FTE	**2,505**	**3,223**	**6,398**

* Changes for FY 2010 from FY 2009 levels are due to bookkeeping revisions in the ATO zero-based budget resulting from efforts to align business planing and budget goal allocation methods. These changes have no substantive impact on the requisite activities associated with this goal. For more information, see the Summary Budget Request Section for the Congestion goal on page four.

[2] In FY 2005, the agency's capacity measure was modified to include both arrival and departure capacity (replacing the daily arrival capacity measure and arrival efficiency rate used previously).

Figure 3. Capacity trends at the 35 OEP Airports



Performance Overview

Aviation system delays occur when the demand for air transport services exceeds the capacity of the system. The ability of the system to respond to demand is a function of airport runway capacity, airspace capacity, the status of air traffic control equipment, and weather conditions.

The total cost of domestic air traffic delays to the American economy is more than $40 billion a year. Commercial air traffic delays directly affect passengers and our national airspace system's ability to meet demand. In addition, delays lead to increased aircraft fuel use, which leads to increased carbon dioxide emissions.

Commercial aviation delays are estimated to cost airlines over $3.0 billion per year. Missed flight connections, missed meetings, and loss of personal time directly affect passengers and our national system capacity to meet air demands. Air traffic volume and adverse weather conditions are the major causes of aviation delays. However, other factors such as runway closures, air carrier decisions, rapid population growth, changes in consumer demand, and environmental considerations can also affect performance.

In the late 1990s, Operational Performance System Network (OPSNET) delays increased steadily, peaking in FY 2000 and FY 2005. Decreased traffic levels in FY 2002 led to a corresponding decline in delays. Meanwhile, recent forecasts indicate that commercial aviation has rebounded. By FY 2011, air carrier, commuter, and air taxi operations are anticipated to increase approximately 10.7 percent from FY 2006. In order to accommodate this growth, the capacity of the NAS must be used more efficiently without compromising the safety of flight.

To address these issues, traffic management specialists at the Air Traffic Control System Command Center (ATCSCC) maintain constant communication with all facets of the aviation community to collaboratively develop and implement solutions to system constraints. By planning throughout the day, FAA and aviation stakeholders work together to adjust traffic demands to meet available capacity. The FAA programs and initiatives outlined in the NextGen Implementation Plan, such as airspace redesign, revised air traffic control procedures, and the introduction of new technology, are expected to further increase the efficiency of the NAS.

Budget Request Justification

The following sections describe the major activities supported by this budget request and highlight the role of each activity and its importance in expanding capacity by using the context of the flight pattern – *Preparing for Flight, Flight,* and *Post-Flight*. While most organizations in the agency support capacity and reduced congestion improvements, ATO takes the lead in reducing delays and improving on-time performance. In FY 2010, ATO plans to spend $2.8 billion of its Operations funding and $1.9 billion of its Facilities and Equipment funding on capacity initiatives, a number of which are highlighted below.

Preparing for Flight

Proactively Managing Traffic Flow

(Operations, Air Traffic Organization, $2.8 billion, 8,516 FTE)

When weather conditions, unexpected demand, equipment outages, or other system constraints impact an airport or portion of airspace, traffic management specialists at the ATCSCC develop a plan to minimize delays and congestion and maximize system capacity. To accomplish this, they proactively plan with numerous aviation stakeholders, and with traffic management specialists at affected air traffic control facilities. ATCSCC specialists evaluate the projected flow of traffic and then implement the least restrictive corrective action necessary to ensure demand does not exceed system capacity.

Air Traffic Management (ATM) (Facilities and Equipment, ATO, $31.4 million): The FAA's Traffic Flow Management (TFM) system is the Nation's single source for capturing and disseminating air traffic information and is the key product for coordinating air traffic across the aviation community. When the NAS is impacted by severe weather, congestion, and/or outages, the TFM system uniquely provides timely information to all aviation stakeholders in order to minimize NAS system delays.

The automation and communication mechanisms provided by the TFM system support the decision-making process that ultimately impacts flight schedules. The TFM system enables FAA Traffic Management Supervisors/Coordinators (TMS/TMC) and flight Airline Operations Centers (AOC) in industry to use common data and automation tools to collaborate and generate daily air traffic flow strategies that balance FAA responsibilities, while preserving the economic flexibility for the customer. FY 2010 funding will support TFM Modernization, related Collaborative Air Traffic Management Technologies (C-ATM-T) Work Package 1 software development activities and the Route Availability Planning Tool (RAPT).

The ATM systems, which include Traffic Flow Management Modernization (TFM-M) and C-ATM-T Work Package 1, provide direct mission support to FAA by ensuring efficient flow of air traffic through the NAS. The TFM-M program has recently replaced obsolete hardware and is in the process of modernizing the software of the current infrastructure. When completed, TFM-M will provide a hardware and software infrastructure that will enable continued development of products and services to more effectively manage the flow of air traffic, while reducing the cost of ownership and ensuring the technological capacity to meet future user and customer needs.

The TFM system is used to balance air traffic demand with capacity to ensure optimum utilization of the NAS. The TFM system also provides infrastructure integration of Collaborative Decision Making products and Collaborative Routing Coordination Tool functionality -- technology products developed under the auspices of the previous Free Flight Phases 1 and 2 programs.

C-ATM-T Work Package 1 focuses on four areas: Airspace Flow Management, Impact Assessment and Resolution, Domain Integration, and Performance Management. These capabilities will improve the usage of existing NAS capacity by improving automation tools and procedures to make air traffic more efficient during periods of adverse weather or excessive volume. Additionally, it will promote the use of automated systems that provide more accurate and timely information to all users and customers, and will implement tools and processes that promote collaborative decisions regarding best routing and scheduling alternatives.

The RAPT addresses an urgent need to increase the airport departure capacity during convective weather. In busy, complex metropolitan areas such as New York, airways are tightly clustered and the proximity of adjacent arrival flows means that deviations around thunderstorms by departures cause serious disruptions to arrivals. As a result, the departure flows are often shut down. RAPT is a Weather-Assimilated Decision Support Tool (DST) that supports the development and execution of departure management plans that more fully utilize the available departure capacity during Severe Weather Avoidance Plans (SWAP). RAPT integrates 3D convective weather forecasts from the Corridor Integrated Weather System (CIWS) with the

NAS airspace structure information (including aircraft trajectory information) to predict the availability of the filed departure route and specifically designated coded alternative departure routes for an aircraft. The RAPT is currently in operation as a prototype in the New York area and requires support for continued operation, evaluation, development and expansion of the demonstration system. RAPT combines state-of-the-art weather forecasts with operational flight data to help FAA traffic managers and airlines determine if future departures will encounter hazardous weather at some point along their intended path, and to determine if opportunities exist to route aircraft through safer skies.

Corridor Integrated Weather System (CWIS) (Facilities and Equipment, ATO, $2.3 million):
Weather accounts for about 70 percent of flight delays – with thunderstorms a prime cause. To help tackle this problem, an upgraded CIWS, used by controllers to move aircraft around bad weather in the heavily congested Northeast corridor since 2001, has now expanded its geographic coverage to include all of the continental United States. In June, CIWS underwent a major software deployment that allows it to capture greater amounts of weather data.

The new prototype system processes, generates, distributes and displays its weather products to traffic management personnel and area supervisors. Using CIWS, which provides better knowledge of future storm positions, controllers are able to keep air routes open longer before being impacted by weather, as well as reopened earlier. This allows for more efficient rerouting around storms, and information on current and predicted storm tops allows aircraft to find opportunities to safely fly above storm areas.

CIWS is in use at numerous locations, including the Air Traffic Control System Command Center in Herndon, VA., eight Air Route Traffic Control Center facilities, six large Terminal Radar Approach Control facilities, as well as several airline operations centers. The new CIWS prototype has shown that fully-automated, high-resolution, three-dimensional weather information, providing zero to two hour forecasts of storm locations, can significantly improve the ability of air traffic control to utilize the maximum amount of safe airspace during severe thunderstorms.

CIWS improves air traffic control productivity by increasing the time required to develop and execute effective convective weather mitigation plans. For FY 2010, the funding will be used to procure hardware and software; complete sensor source date interface engineering, development documentation, unit/integration testing, establish configuration management; technology transfer testing; technical program support; and Independent Operational Test and Evaluation (IOT&E).

Replacing Obsolete Communications Equipment

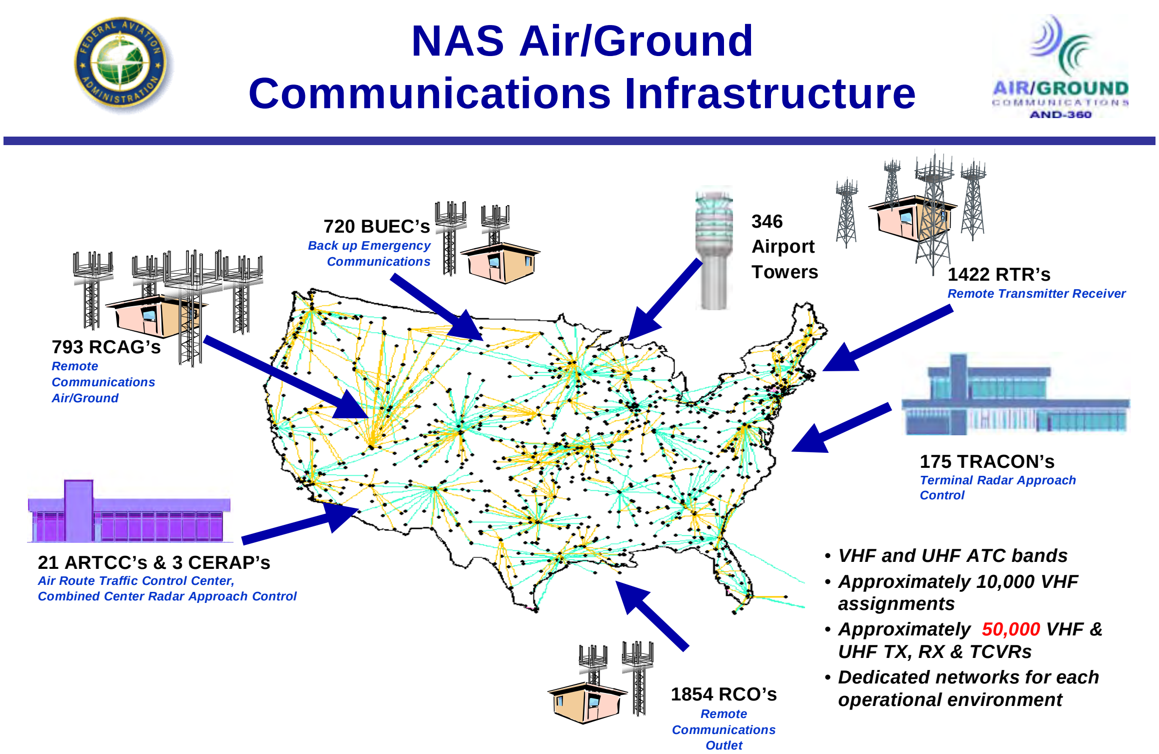
Airport Cable Loop Systems – Sustained Support (Facilities and Equipment, ATO, $6.0 million):
This program will replace on-airport, copper-based, signal/control cable lines that have deteriorated with fiber optic transmission systems. The obsolete underground telecommunications cable infrastructure systems are vulnerable to failure and could cause outages. In FY 2010, $6.0 million is requested to begin projects for John F. Kennedy, Baltimore, Cleveland, Fort Lauderdale, Philadelphia, Oakland, Ontario, Los Angeles, and Van Nuys airports. The funding will also provide for upgrade and retrofit support, program support, engineering, training, logistics support, testing, and configuration management.

Air-to-Ground Communications Infrastructure (AGCI) Program (Facilities and Equipment, ATO, $8.6 million): AGCI improves air traffic operational efficiency and effectiveness by modernizing the current communications infrastructure through all NAS environments (both en route and terminal). This program replaces old and increasingly antiquated technology and establishes new facilities intended to broaden communications coverage. AGCI encompasses several programs including the following programs:

Air Ground Communications Infrastructure (AGCI) Program
(Facilities and Equipment, ATO, $8.6 million)

Program		Purpose
Communications Facilities Expansion Program	➔	Provides for new radio control facilities and/or modifies existing facilities to enhance the air-to-ground communications between air traffic control and aircraft.
Radio Control Equipment Program	➔	Total replacement program for all Air Route Traffic Control Centers (ARTCC), Remote Communication Air/Ground, Terminal Radar Approach Control (TRACON)/Air Traffic Control Towers (ATCT), remote transmitter/receivers, Automated Flight Service Stations, and remote communications outlet facilities.

Figure 4 illustrates the Air-to-Ground Communications Infrastructure system.



Laying the Foundation for the Next Generation Air Transportation System

Aviation is a driving force in America's economic growth. The current infrastructure of the nation's air transportation system is, however, inherently limited in its ability to grow and adapt. The current air traffic system has served the nation well since the 1950s and it continues to be the basis of the world's largest and safest air transportation system. If FAA is to respond to increasing demand and to create a scalable and adaptable system, it must do so in a way that also improves safety and reduces adverse impacts on the environment. This means FAA will need to completely change its approach to the way the system will function in the twenty-first century.

In 2003, Congress enacted VISION 100 – Century of Aviation Reauthorization Act which chartered the JPDO to begin work on the planning and implementation of NextGen. What Congress envisioned, and what has developed since, is an unprecedented initiative. It involves the DOT, DHS, DoD, DOC, NASA, and the White House Office of Science and Technology Policy. The vision encompasses all areas of the aviation community, including general aviation, commercial and public safety helicopter operators, and traditional commercial and business flight operations. NextGen is our nation's response to the challenges faced by the aviation community.

In the near-term, the NextGen portfolio of investments focuses on the development and implementation of key NextGen transformational technologies. These include: Automatic Dependent Surveillance-Broadcast (ADS-B), System Wide Information Management (SWIM); Data Communications, NextGen Network-Enabled Weather (NNEW); and NAS Voice Switch (NVS). The capabilities these technologies provide represent a shift of decision-making from the ground to the cockpit. In the future, flight crews will have increased control over their flight trajectories and ground controllers will become traffic flow managers.

NextGen is designed to address many of the most significant limitations to growth in the current air transportation system. These include runway capabilities and the inherent limitations of ground-based control of en route and terminal area airspace and the vulnerability of the system to weather. FAA's implementation commitments that contribute to NextGen are detailed in the NextGen Implementation Plan and the NAS Enterprise Architecture, which ties the NextGen portfolio of programs, activities, and schedules together.

Joint Planning and Development Office (Research, Engineering and Development, $14.4 million):

As the interagency steward of NextGen, the JPDO seeks to address long-term imbalances in aviation capacity and demand. At the same time, it seeks to ensure that the future operating environment is safe, well managed, environmentally responsible, and harmonized with international standards. JPDO's mission is to lead the interagency transformation of today's aviation system to that future. The scope of this initiative and the JPDO's mission contributes to all of the FAA's current strategic goals.

The FY 2010 budget request of $14.4 million will be used to:

Joint Planning and Development Office
(Research, Engineering and Development, $14.4 million)

NextGen Support

- ➔ Continue to refine NextGen foundational documents: Concept of Operations, Enterprise Architecture, and Integrated Work Plan within the Joint Planning Environment (JPE).
- ➔ Enhance the JPE planning information to reflect Integrated Surveillance Study Team results, operational scenarios that describe information sharing and procedures between flight and airline operations and NextGen trajectory based flight processing including air navigation service providers and flight operations centers. Continue to work with partner agencies to facilitate multi-agency alignment of the Enterprise Architecture and Integrated Work Plan.
- ➔ Develop an inter-agency integrated surveillance architecture, concept of operations , and funding profile as well as a proposal for a future governance process.
- ➔ Establish Network Enabled information sharing standards for participating agencies and organizations including multi-agency governance processes.
- ➔ Track and ensure that partner agencies are implementing programs that support a transition to the end-state architecture as defined in the Integrated Work Plan.
- ➔ Develop FY 2012 formulation package to support NextGen resource planning and development of the NextGen Business Case.
- ➔ Develop FY2012 NextGen business case including results of the analysis of environmental mitigation methods and benefits.
- ➔ Develop Dynamic Airspace Configuration research transition plans that results in a far-term concept for efficient partitioning of airspace and allocation of resources to meet NextGen capacity needs.
- ➔ Update the JPE to include demonstrations results from NEO Spiral 2, Virtual Tower Demonstration, UAS flight trials in Florida, Surface Trajectory Based Operations in Memphis, and Oceanic In-trail Climb and Descent Initiative.

Automatic Dependent Surveillance Broadcast (ADS-B) NAS Wide Implementation (Facilities and Equipment, ATO, $201.4 million): ADS-B is an advanced surveillance technology that provides highly accurate and more comprehensive surveillance information via a broadcast communication link. ADS-B is a surveillance technique in which aircraft provide, via a data link, flight data derived from on-board position-fixing and navigational systems. Aircraft determine their position (longitude, latitude, altitude, and time) using GPS, internal navigational reference system, or otherwise. The aircraft's ADS-B equipment function processes this position information, along with other aircraft-derived flight parameters, into a periodic broadcast transmission, typically once a second, of the aircraft's position. Any airborne or ground-based ADS-B capable receiver, within range of broadcast, may receive and process the surveillance information for a variety of functions or uses.

The greater positional accuracy and ability to provide aircraft-derived, additional flight parameters (flight objects or flight data message elements), in addition to position data, defines ADS-B as "enhanced surveillance." The aircraft provides unique flight parameter information with the broadcast of its surveillance position. These other parameters, such as identification, directional vector, velocity, next waypoint, and other data are limited only by the equipment's capability, the communication link capacity, and the receiving system's capability. Additionally, ADS-B equipment may be placed on ground vehicles or obstacles to allow locating and identifying these items. The FAA's ADS-B system is based primarily on providing three fundamental broadcast services to support the ADS-B enabled applications:

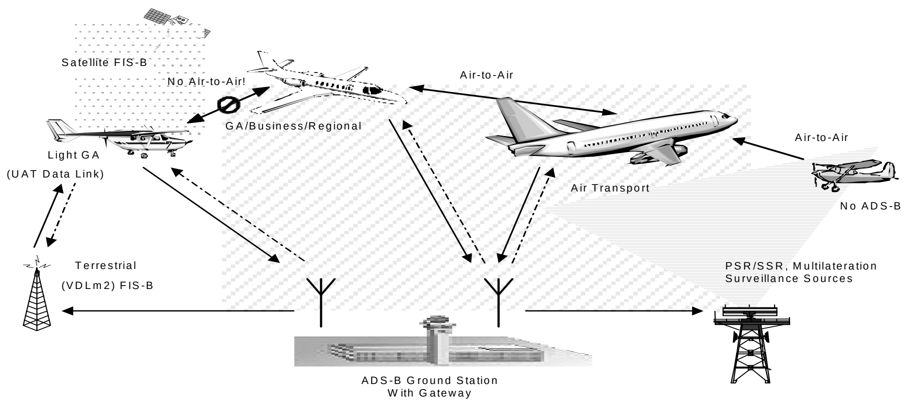
1. ADS-B – this service provides highly accurate, aircraft-derived ADS-B reports that contain identification, state vector, and status/intent information about the aircraft. The information will be used for surveillance applications. ADS-B information is broadcast by the ADS-B equipped aircraft, received and processed by the ADS-B on-board avionics, and displayed on the aircraft's multi-function display.
2. TIS-B – Traffic Information Services provide ADS-B equipped aircraft with a more complete "picture" in situations where not all aircraft are equipped with ADS-B. TIS-B is a service that provides ADS-B equipped aircraft with surveillance data about non-ADS-B equipped aircraft. TIS-B comprises surveillance information provided by one or more surveillance sources, such as secondary or primary surveillance radar. The surveillance information is processed and converted for use by ADS-B equipped aircraft. TIS-B can also be used in ADS-B implementations involving multiple ADS-B data links to provide a cross-link or gateway between ADS-B equipped aircraft using the different data links. This TIS-B sub-function is identified as Automatic Dependent Surveillance – Rebroadcast (ADS-R). Two communication link protocols have been approved for ADS-R use; Universal Access (UAT), used mostly by general aviation aircraft, and the 1090 extended squitter, which broadcasts but does not receive signals, normally used in commercial transport aircraft.
3. FIS-B – Flight Information Services provide ground-to-air broadcast of non-control, advisory information which provides users valuable, near real-time information to operate safely and efficiently. FIS-B products include graphical and textual weather reports and forecasts, Special Use Airspace Information, Notices to Airmen, and other aeronautical information.

For FY 2010, activities will focus on attaining an In-Service Decision for ADS-B on July 9, 2010. To support this effort there is a need to obtain Initial Operating Capability (IOC) at each of the automation platform sites. The schedule is as follows:

- Louisville (SDF) IOC for CARTS Automation interface by October 2009;
- Philadelphia (PHL) IOC for STARS Automation interface by February 2010;
- Gulf of Mexico (GOM) IOC for En Route Automation Modernization (ERAM)/HOST Computer Automation interface by December 2009; and
- Juneau (JNU) IOC for MicroEARTS Automation Interface by April 2010.

In addition to these activities, a corresponding effort is underway to publish a rule to the Federal Register addressing the mandatory equipage of ADS-B out transponder in aircraft using specific airspace. This final rule is scheduled to be published in the Federal Register in 2010.

Figure 5. Automatic Dependent Surveillance Broadcast (ADS-B) System Overview



System-Wide Information Management (SWIM) (Facilities and Equipment, ATO $54.6 million): Point-to-point operations characterize today's NAS. In contrast, networks can enable multiple parties to share information by linking individual systems together. To support the NextGen long-term vision of shared common knowledge of situations, SWIM uses an Internet-like network to make information accessible, securable, and usable in real-time for all users. For example, shared networks would enable FAA to share information with the international aviation community, other government agencies, and the aviation industry.

SWIM will help transition the NAS to network-centric operations by providing the infrastructure and associated policies and instructions to enable NAS-wide information sharing. Underlying this transition is a scalable, standards-based network architecture – to be developed through this project – that seamlessly and securely connects users with the NAS information they need. SWIM provides advanced information distribution and sharing capabilities to support a wide range of air traffic control activities, such as negotiating and tracking flight plans, tracking aircraft movement via surveillance, and sharing weather information with NAS service providers and users. The following table provides a brief synopsis of the initiatives to be funded by this request.

SYSTEM-WIDE INFORMATION MANAGEMENT (SWIM)	
Segment 1 Development (Facilities and Equipment, ATO, $54.6 million)	
Purpose:	**Initiatives:**
Development of Segment I – Include design, development, and test of Initial Segment I capabilities.	➔ Complete requirements definition for initial TFM flow object ➔ Code and test ERAM initial flight data services ➔ Complete AIM SUA development and test ➔ CIWS software design and test ➔ Conduct analyses and prepare documentation for Final Investment Decision for Segment 2

NextGen Network Enabled Weather (NNEW) (Facilities and Equipment, ATO, $20.0 million): The NextGen NNEW effort will develop the standards necessary to support universal user/system access to needed weather information. It will enable the seamless access to standard weather data sets by all NextGen users by establishing the 4-Dimensional (4-D) Weather Data Cube. The 4-D Weather Data Cube will be a shared, 4-dimensional (three spatial dimensions and time) virtual database consisting of extensive sets of weather information. It will include the data that will be designated to be the single authoritative source for weather information. It will provide consistent, tactical and strategic-level weather information that will be accessible by all NAS stakeholders. The databases that the 4-D Weather Data Cube will consist of will be distributed among multiple, physical locations and suppliers that are connected and accessible by communication networks supported by World Wide Web concepts and technology. NNEW is responsible for establishing the information management capabilities necessary for the operations of the network-enabled 4-D Weather Data Cube. There will be demonstration efforts to resolve key technical questions and reduce implementation risk of a network-enabled weather environment to the FAA and external system users. This will include assurance that NNEW is fully compatible and consistent with the evolved System-Wide Information Management (SWIM) infrastructure. This will also serve to define open standards and requirements necessary for overall NextGen weather dissemination compatibility.

For FY 2010, $20 million is needed to develop Weather Product Data Format Standards v3 for Initial Operating Capability (IOC) Baseline, develop Weather Specific Services Design Standards v3 for IOC Baseline, develop Risk Reduction Activities for candidate IOC publisher/subscriber systems, Demonstrate Interagency Network Enabled Weather Data Sharing and begin developing Final Exhibit 300 program information Program Baseline.

NextGen Demonstrations and Infrastructure Development (Facilities and Equipment, ATO, $33.8 million): NextGen demonstrations will be conducted in close cooperation with both internal FAA and JPDO. Demonstration, developmental, and validation activities, transforming technology resources (demonstration sites and end-to-end demonstration activities) will include the following for FY 2010:

NEXTGEN TECHNOLOGY DEMONSTRATION (Facilities and Equipment, ATO, $33.8 million)		
Purpose:		**Benefit:**
Environmental: International Air Traffic Interoperability	➔	Continued demonstrations of trajectory-based management in the arrival domain to collect benefits data for a reduction in the carbon footprint of aviation operations.
	➔	Flight demonstrations across the Atlantic to provide requirements and standards for future automation upgrades.
	➔	Surface management improvement demonstrations to reduce taxi times for less fuel consumption.
High Density Airport (HDA) Capacity and Efficiency Improvement Project	➔	A second site demonstration of the 3D Path Arrival Management tool will be conducted to collect additional data to enhance efficiency, provide greater capacity, and reduce fuel consumption.
Unmanned Aircraft Systems (UAS) 4D Trajectory Based Demonstration	➔	Flight trials will be conducted in Florida to facilitate the need for integration of DoD and other governmental agency UAS operations into the NAS. Demonstrations provide a means to validate and prove concepts and establish confidence in the safety case for UAS. Demonstrations support on-going work of RTCA Special Committee 203 (SC-203) which is developing performance requirements for operation of UAS in the NAS. This work will lay the foundation for the Minimum Aviation System Performance Standards (MASPS) for UAS and other regulatory criteria leading to the safe operations of UAS in the Next Generation Air Transportation System (NextGen).
Staffed NextGen Towers	➔	Air Traffic System Concept Development will conduct cognitive walkthroughs, rapid prototyping, and human-in-the-loop simulations to refine the Staffed NextGen Tower (SNT) concept and requirements. FAA will conduct a field demonstration for Phase 1 of the SNT concept in FY 2010.
	➔	A field demonstration will be conducted at a site to be determined (TBD) using an SNT system in FY 2010. The field demonstration will serve as a proof of concept and as a comprehensive site for testing of the technology in an operational environment. Operational, technical, and human factors data will be collected and user feedback obtained on their assessment of the operational feasibility, suitability, and acceptability of the concept.
Demonstration Site Development/Sustainment	➔	The demonstration sites being considered include Orlando, FL; Dallas, TX; and the FAA's WJHTC. Demonstrations will continue to be conducted for faster and more reliable testing and results using multiple systems—the beginning of integration of NextGen. We will emphasize the integration of individual-domain (intra-domain) which would allow for end-to-end (or multi-domain) demonstration and testing. These sites will provide immediate (near-term) integration of new emerging technologies, or applications into existing or planned demonstrations, while NAS customers see these sites as a visible, near-term step toward initiatives that support

NEXTGEN TECHNOLOGY DEMONSTRATION (Facilities and Equipment, ATO, $33.8 million)	
Joint Planning Development Office	government/industry partnerships. ➔ The JPDO will enhance and maintain the multi-agency Joint Planning Environment that provides a transparent web-based view of Enterprise Architecture and Integrated Work Plan information.

Discretionary Increase: NextGen Staffing Increase
(Operations, Air Traffic Organization, $7.0 million, 52 FTE):

The FAA contracted with the National Academy of Public Administration (NAPA) to establish a panel of experts to identify skill sets required to integrate and implement the NextGen Program into the NAS. NextGen staffing for the ATO operations organization is most critical in the NextGen Operations Planning (AJP) and operational service units. The AJP senior vice president, who is responsible for NextGen integration and implementation, is preparing to bring on board new program managers, engineers, scientists, system integrators, contracting officers, and other support positions to support the accelerated NextGen Program. Additionally, significant policy origination must occur, using many of the 104 FY 2010 staff (52 FTE). A transformation must take place that will establish strategies to obtain the expertise necessary to manage, integrate, and implement these complex activities.

Additionally, the operational organizations will be involved in concept review and validation, prototyping analysis, review and validation; human factors review and validation; requirements analysis and validation; training assessment and development; and procedural analysis, review, and development/modifications.

Improving Efficiency, Building and Maintaining Runways
(Grants-in-aid for Airports, Office of Airports, $1.6 billion, 282.5 FTE)

In FY 2009, five airfield projects have been completed (2 new runways, 1 runway extension, 1 end around taxiway, and a second of three runway projects at Chicago O'Hare). Currently, three OEP airports have airfield projects under construction which are to be commissioned by FY 2010. These airfield projects include one new runway, completion of Phase 1 of the airfield reconfiguration of Chicago O'Hare, and one center taxiway. In addition, there are currently 11 other projects at OEP airports in various stages of the planning and environmental processes – three airfield reconfigurations, four runway extensions, and four new runways.

The FAA also works with local and regional authorities to examine regional solutions to improve capacity and reduce delays. The agency provides vital technical and financial assistance for planning, environmental analysis, and construction/rehabilitation of runways, taxiways, and aprons. The FAA also actively participates in developing and maintaining the Runway Template Action Plan, which supports the timely commissioning of the runways. Further, AIP funding is directed to ensure that 93 percent of runways at airports in the National Plan of Integrated Airport Systems (NPIAS) are maintained in good or fair condition, ensure support of the Military Airport Program, develop reliever airports, and support research of airfield pavements to carry existing and new generation aircraft. The AIP funding plan will reflect a special emphasis on increasing capacity.

Discretionary Increase: Airport Planner/Geographic Information System Staff
(Grants-in-aid for Airports, Office of Airports, $80,000, 0.5 FTE)

One new position is needed to successfully implement an Airport Geographic Information System (GIS) and electronic airport layout plans (e-ALPs). Electronic ALPs and Obstruction Charts will allow us to standardize the process of performing airport and aeronautical surveys and to produce them in an expedited and a cost-effective manner. This is a critical national planning effort and will require an additional staff person to oversee the development and implementation of this effort. Responsibilities for this position include providing information and guidance to FAA field offices concerning implementation/deployment; setting priorities; and establishing an outreach workshop for internal and external users.

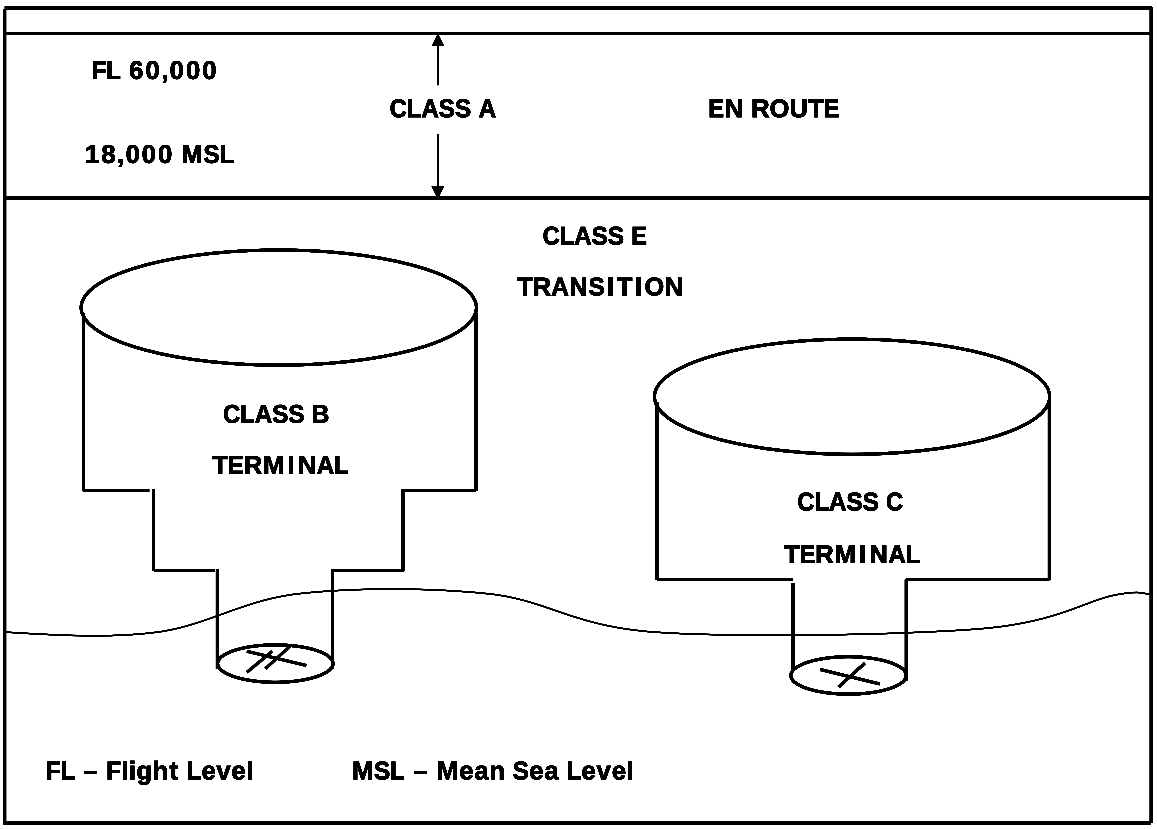
Flight

Improving Traffic Flow Near Terminal Areas

(Operations, Air Traffic Organization, $2.8 billion, 8,516 FTE)

Terminal airspace is a critical lynch pin in the efficient use of airport capacity. Congestion, complexity, and limited departure points in the current airspace can result in restrictions, limiting airport departure throughput. Likewise, inefficient holding and arrival routes can limit airport arrival throughput. Terminal airspace redesign focuses on enhancing available resources to make transition to and from the airport more efficient by adding routes and applying appropriate area navigation (RNAV) or Required Navigation Performance (RNP) procedures. Figure 4 on the following page illustrates U.S. airspace classes, which include terminal and en route airspace. Terminal airspace includes classes B, C (shown), and D (not shown). Class A encompasses en route airspace and is physically above all the other classes. Generally, if the airspace is not Class A, B, C, or D, and it is controlled airspace, it is Class E airspace.

Figure 6. Distinction between Terminal and En route Airspace



Terminal airspace redesign also is essential in the delivery of increased capacity associated with the implementation of new runways. Without airspace redesign, these new runways will not be able to deliver the proposed capacity changes. Studies have shown that 40 percent to 60 percent of projected capacity from new concrete will be lost without the necessary changes to terminal (and en route) airspace. These changes include new fixes, routes, and sector structure to allow aircraft to use the new runways.

Terminal airspace optimization (mid-term) and redesign (long-term) projects are ongoing across the United States. Efforts are planned for all major metropolitan areas and congested terminal areas servicing key airports, focusing on the airspace associated with the 35 OEP airports. When completed, these projects will reduce complexity, balance controller workload, and reduce en route flow constraints. The operational outcome will be fewer restrictions and reduced flight delays.

Automated Surface Observing System - ASOS (Facilities and Equipment, ATO, $5.5 million): Accurate, reliable weather information is critical to the efficient use of the Nation's airspace. Automated weather observing equipment improves the quality, frequency, and timeliness of weather observations and reduces costs and the time air traffic controllers spend on weather observation duties. Benefits will include continued and expanded capability for Instrument Flight Rules flight operations, improved continuous observation capability at a significantly reduced cost from manual observations, and high quality, real-time weather data communication. FY 2010 funding will procure the first 238 Enhanced Precipitation Identification (EPI) sensors and continue ceilometer installations as part of the ASOS Pre-Planned Product Improvements (P3I) program.

Improving En Route Efficiency

(Operations, Air Traffic Organization, $2.8 billion, 8,516 FTE)

Congestion in transition and en route airspace often limits the ability to get departing aircraft off the ground and can also limit arrivals—even if runway capacity is available. Increased flexibility is needed to address the challenges caused by traffic volume and severe weather in en route airspace. Restrictions often are put in place to manage demand for access to en route airspace when levels exceed what can be safely handled. Transition and en route airspace congestion often limit the ability to get departing aircraft off the ground and limit arrivals, even if runway capacity is available. In response, restrictions often are put in place to manage demand for access to en route airspace when levels exceed what can be safely handled. Increased flexibility is needed to address the challenges caused by traffic volume and severe weather in en route airspace.

High Altitude Airspace Management (HAAM) is the Airspace Management Program effort to renovate the high altitude en route environment. The goal is to move from the constrained, ground-based route structure to an area navigation (RNAV) environment focused on user flexibility, efficiency, and predictability. RNAV procedures and routes are used to develop new air traffic paths that reduce flow complexity by permitting aircraft to fly optimum routes with little controller intervention. RNAV-equipped aircraft offer improved access and flexibility for point-to-point operations

Air Traffic Control Beacon Interrogator Replacement (Facilities and Equipment, ATO, $4.7 million): The FAA's existing surveillance Air Traffic Control Beacon Interrogator (ATCBI-4/5) systems have reached the end of their life cycles and many of the parts are already obsolete. The inability to replenish spares is putting the availability of Secondary Surveillance Service at risk. Furthermore, the existing analog beacons are incompatible with new digital automation systems. The replacement system, known as ATCBI-6, significantly enhances en route air traffic controllers' ability to separate aircraft, while reducing their workload and improving the accuracy of aircraft position and altitude data. For FY 2010, $4.7 million will complete acquisition and deployment activities for the program. Funds will complete:

- Construction, installation and commissioning activities at cost share sites, Provo, UT and Santa Fe, NM;
- Commissioning activities at all other remaining sites including the Beacon Only Facility Sites;
- Disposal of ATCBI-4/5 systems; complete Rotary Joint installations;
- Three-year update of the Security Certification and Authorization Process (SCAP) for the period of 2010 through 2012, and
- Transition of the program to steady state in 2012.

En Route Automation Modernization (ERAM), (Facilities and Equipment, ATO, $171.8 million): ERAM replaces the Host computer system and Direct Access Radar Channel (DARC) software; hardware and associated interfaces; and communications and support infrastructure. ERAM will provide existing functionality and new capabilities to support the NAS architecture evolution, Air Traffic Services operational requirements, and information security requirements. ERAM will improve the efficiency of the air traffic control system by allowing varying standards of separation, enabling flexible routing around congestion and weather restrictions, and providing automated hand-offs.

ERAM development and deployment is being conducted incrementally in order to reduce risk, provide early benefits, address equipment sustainment issues, and to ensure a stable system during the transition from the Host computer system.

For FY 2010, $171.8 million will continue life-cycle system maintenance activities which include En Route Information Display System (ERIDS) 2nd level engineering support, ERAM 2nd level engineering support, ERIDS Contract Level Depot Support (CDLS), ERAM CDLS, and ERAM On-Site Software Maintenance. Funding will also be used to develop, integrate, and test ERAM Release 3 and for Independent Operational Test and Evaluation (IOT&E).

EN ROUTE AUTOMATION MODERNIZATION (ERAM)	
(Facilities and Equipment, ATO, $171.8 million)	
Purpose:	**Steps:**
Complete transition from current system to modernized, En Route system architecture while maintaining critical services.	➔ Replacement of the Direct Access Radar Channel and the addition of safety alerts through the Enhanced Back-up Surveillance (EBUS) effort. ➔ National deployment of the En Route Information Display System (ERIDS), an important tool for providing the early benefits of improved productivity and efficiency that distributes important information to air traffic controllers electronically. ➔ ERAM Release 1 is the replacement of the Host Computer System with new software and hardware and the integration of these elements within evolving En Route system architecture in coordination with the other elements of the En Route Automation Program ➔ ERAM Releases 2/3 will contain software maintenance updates and further functional enhancements.

Voice Switching and Control System (VSCS), (Facilities and Equipment, ATO, $16.7 million): The VSCS Upgrade and Tech Refresh are ongoing programs to replace and upgrade the obsolete, non-supportable VSCS hardware and software in all 21 Air Route Traffic Control Centers (ARTCC), the Mike Monroney Aeronautical Center, and the William J. Hughes Technical Center. These upgrades will ensure that the air-to-ground and ground-to-ground communications capabilities are reliable and available for separating aircraft, coordinating flight plans, and transferring information. In FY 2010, $16.1 million will continue the retrofit of VSCS power supplies, the development of depot test equipment of repeater/LAN efforts, product lifecycle management (PLM) to C++ code conversion activities, engineering analysis, and development of a replacement for the VSCS Training and Backup Switch (VTABS) Test Controller. An additional $600,000 is for in-servicing engineering.

ARTCC Building Improvements / Plant Improvements (Facilities and Equipment, ATO, $51.3 million): The ARTCC Improvements program supports en route air traffic operations and service-level availability through facility lifecycle program management of the 20 ARTCCs, two Center Radar Approach Control (CERAP) facilities at San Juan and Guam, the Honolulu Control Facility, and the Air Traffic Control System Command Center. Most of the buildings and systems are over 40 years old and pose risks of system failure that can adversely affect air traffic operations. For example, in June 2001 a fire in a 22-year old kitchen at the Cleveland ARTCC resulted in an evacuation of the control room and the loss of ATC capability for 16 minutes over 65,000 square miles. As a result, 50 flights were delayed and all en route traffic was routed around the Cleveland airspace. In FY 2005 alone there were eight catastrophic occurrences of pipe ruptures which could have similarly affected operations. At the Washington ARTCC, plastic sheeting had to be draped over air traffic control positions to maintain operations.

For FY 2010, $50 million will continue ARTCC modernization and sustainment projects. Major construction projects will replace obsolete support equipment in operations and training areas. These projects will include asbestos abatement, mechanical and electrical system replacements, fire detection and protection upgrades as well as interior architectural construction. All facilities will also receive smaller sustain projects targeted at eliminating infrastructure failure modes by replacing mission critical components. An additional $1.3 million will also fund in-service engineering activities.

Next Generation VHF Air-to-Ground Communication System (NEXCOM), (Facilities and Equipment, ATO, $70.2 million): The continuous growth in air traffic, along with the introduction of new services such as the broadcast and transmission of new weather products, has driven a proportional demand for new Air-to-Ground (A/G) communication frequency channels. This approximately four percent annual growth in frequency demand can no longer be satisfied with the available spectrum in high-density areas. The lack of available spectrum for new radio channels will prohibit the addition of new ATC sectors and other Air-to-Ground services needed to maintain the efficiency and effectiveness of the NAS. This inability to enlarge and adjust NAS communications to accommodate air traffic growth will result in unacceptable delays for system users.

For FY 2010, $33.7 million is requested for NEXCOM Segment 1a. Segment 1a multimode digital radios will be installed at 160 sites across the United States, including Alabama, Alaska, Arizona, Arkansas, California, Colorado, Florida, Idaho, Indiana, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maine, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Mexico, New York, Nevada, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming.

Improving Oceanic Airspace Efficiency
(Operations, Air Traffic Organization, $2.8 billion, 8,516 FTE)

Oceanic air traffic is projected to continue to grow at a higher rate than domestic air traffic, primarily in the highest density areas. In addition, the market demands expanded capacity through improved operational and fuel efficiency. With the present oceanic airspace structure, users are constrained in choice of routes and do not receive timely granting of requests for clearance changes. This results in increased operating costs due to less than ideal routes.

Allowing properly equipped aircraft and qualified aircrews to operate under reduced oceanic separation enables more aircraft to fly optimal routes. This enhances aircraft flight time as well as fuel and payload efficiency, and may provide more opportunities to add flights without delays.

While much of oceanic airspace has not reached capacity limitations yet, increased efficiency through procedural and other operational improvements can provide benefits to controllers and airspace users. Because all oceanic airspace is also international airspace, changes in the oceanic airspace environment require coordination and collaboration with international colleagues to ensure a seamless operational environment. With potential changes in operational responsibilities for oceanic airspace users and air traffic service providers, it is important that FAA continue its global leadership.

Oceanic Automation System (Facilities and Equipment, ATO, $7.7 million): The Advanced Technologies and Oceanic Procedures program (ATOP) will replace existing oceanic air traffic control systems and procedures with a single integrated system, modernizing facilities responsible for managing over 24 million square miles of airspace over the Atlantic and Pacific Oceans, including the Oakland, New York, and Anchorage ARTCCs. ATOP will provide a fully modernized oceanic air traffic control automation system including, installation, testing, training, common procedures, and lifecycle system maintenance. ATOP also allows FAA to meet international commitments to reduce aircraft separation standards, thereby dramatically increasing capacity and efficiency for the agency's customers. In fact, controllers are able to reduce aircraft separation with ATOP from 100 nautical miles to 30 nautical miles.

For FY 2010, $7.7 million is requested to continue ATOP Preplanned Product Improvements for enhancements to ATOP software for procedural and radar operations, provide for information security and logistics support, provide for the required level of program and engineering support, and provide technology refresh for DOTS Plus software.

Eliminating Capacity Constraints

The systems discussed below allow FAA and its employees to eliminate capacity constraints in NAS where possible, whether they are due to the physical constraints of its facilities or due to outdated and overloaded automation systems.

Standard Terminal Automation Replacement System (STARS) (TAMR Phase 1) (Facilities and Equipment, ATO, $28.0 million): STARS replaces the 47 oldest and most operationally critical Automated Radar Terminal System (ARTS) IIIA's (43) and Common ARTS IIE's (4) sites. STARS assists controllers in separating air traffic during arrivals, departures, and over-flights at airports by providing new air traffic control workstations with state-of-the-art computers, displays, and commercially based software. STARS provides a digital system to meet expanding air traffic control needs through 2031.

For FY 2010, $10 million will fund Terminal Enhancements. These activities cover STARS software enhancements. With STARS firmly established in the operational phase of its life-cycle, software enhancements are required for the baseline software to improve system performance, efficiency, ease of use and support, and to incorporate safety and security modifications. These software baseline enhancements are also required to ensure the agency continues to meet its strategic goals for increased safety and greater capacity as identified in the FAA Flight Plan, 2006-2010. Additionally, funding will cover program and system engineering technical support, and operational/suitability testing of software and system enhancements. Also for FY 2010, $18 million is for engineering change proposal (ECP) pop-ups, at a predicted annual rate of 4 ECP's per year is provided. This is an on-going task which requires continual monitoring and replacement of system components due to COTS vendors EOL and EOM announcements. This is a risk reduction and cost stabilizing activity.

Terminal Air Traffic Control Facilities – Replace (Facilities and Equipment, ATO, $176.0 million): The FAA provides air traffic control services from over 500 ATCT and TRACON facilities and must continually replace portions of this infrastructure to ensure an acceptable level of air traffic control service and to meet current and future operational requirements. The average age of a control tower is 28 years and a TRACON is 25 years, with some as much as 50 years old. Control towers built over 20 years ago do not meet today's operational requirements or current building codes and design standards.

Terminal facility replacement projects are funded in five phases to provide sound financial management of projects. The table below provides an overview of the phases of ATCT and TRACON replacement efforts.

TERMINAL AIR TRAFFIC CONTROL FACILITIES – REPLACEMENT (Facilities and Equipment, ATO, $176.0 million)				
Phases of Terminal Facility Projects				
Phase I	**Phase II**	**Phase III**	**Phase IV**	**Phase V**
Site Selection	Facility Design	Facility Construction	Equipment and Utilities Installation	Asset Disposition: Decommissioning, Demolition, or Refurbishing of the old facility
Advance Engineering	Electronic Equipment Design			
	Electronic Equipment Procurement			

For FY 2010, $176 million is requested to fund three phases of facility deployment to continue replacing aging facilities. This includes: Phase III construction funding for three sites; Phase IV/V funding for 16 sites. Also included in this request is funding for other direct program costs. Products and services delivered include: formal facility requirements documentation, sitting evaluations for all ATCT planning locations under consideration, preliminary engineering, and program management.

Air Traffic Control Tower (ATCT)/Terminal Radar Approach Control (TRACON) Facilities – Improve (Facilities and Equipment, ATO, $38.9 million): The FAA must continually upgrade and improve aging terminal facilities and equipment to provide an acceptable level of service and to meet current and future operational requirements. Since their initial construction, almost all ATCT and TRACON facilities have had to address additional operational and safety requirements in the areas of accessibility, hazardous materials, seismic events, and security. Facility improvements must incorporate these new requirements and ensure an orderly transition to the new configuration for relocated/replaced equipment with minimal impact on existing operations.

FY 2010 funding will be used to initiate seismic modifications; improve, repair, and sustain ATCT/TRACON facilities that are not candidates for replacement (includes the relocation of approach control functions to other existing locations, reducing the number of approach control facilities, while providing the same service); support system engineering, configuration management, risk management, facility planning, and other program support services; for facility condition assessments; and for in-service engineering.

Terminal Digital Radar (Facilities and Equipment, ATO, $12.6 million): In the Terminal Digital Radar Program, new digital Airport Surveillance Radar Model 11 (ASR-11) radar systems will replace existing ASR Models 7/8 primary radar systems and associated Air Traffic Control Beacon Interrogator Models 4/5 (ATCBI 4/5) secondary radar systems. This will ensure continuation of surveillance service with improved air detection and expanded six-level weather detection/display capability.

In FY 2010, $8.2 million is requested to procure 10 demolition and restorations and purchase the final set of depot spares, as well as the continued deployment of the systems purchased in previous years. The program plans to commission two systems. In addition, $4.4 million is requested to procure 17 technical refresh retrofit modification kits and install 12 kits.

Terminal Voice Switch Replacement (TVSR) / Enhanced Terminal Voice Switch (ETVS) (Facilities and Equipment, ATO, $10.5 million): The ongoing TVSR/ETVS program involves replacing the aging, obsolete voice switches in the ATCTs and TRACON facilities. Voice switches enable air traffic controllers to communicate with aircraft as well as with other air traffic control facilities. To date, this program has replaced 457 of 477 terminal switches throughout the NAS. The program also provides the contract vehicles for the FAA to procure voice switch equipment for new and modernized terminal facilities. For FY 2010, $10.0 million is requested to procure, test, deliver, and install ten terminal voice switches. An additional $500,000 is requested for in-service engineering.

GLOBAL CONNECTIVITY

Introduction

On the leading edge of international cooperation is commercial aviation, which has grown 70-fold since the first jet airliner flew five decades ago. Aviation systems within and among nations are lifelines to the future, freer trade, accelerated economic growth, and to greater cultural exchange. Seamless global aviation is critical to an increasingly global economy that hinges on efficient supply chains and just-in-time manufacturing.

The FAA is uniquely positioned to provide leadership in the global aviation community through expanded technical assistance to other civil aviation authorities, and continued emphasis on bilateral agreements to help harmonize aviation safety and environmental quality around the world. Today, FAA has operational responsibility for about half of the world's air traffic, has certified more than two-thirds of the world's large jet aircraft, and has provided assistance to more than 130 countries to improve their aviation systems.

The FAA, however, must become even more globally focused to strengthen America's aviation leadership role in both safety and air traffic control and to ensure that U.S. citizens can travel as safely and efficiently around the world as they do at home.

In FY 2010, to help improve safety, FAA will expand its training and technical assistance programs that help civil aviation authorities meet international safety standards. The FAA will also continue its work with global partners to promote wider adoption of safety technologies. In addition, for greater connectivity, FAA is targeting efforts to promote seamless global operations in cooperation with international partners and the International Civil Aviation Organization (ICAO).

Organization

This budget request is organized by the following DOT performance measures: 1) expand the use of NextGen performance-based systems, 2) promote international aviation development projects, and 3) increase contracts awarded to disadvantaged and women-owned businesses.

Narrative sections contain parenthetical inserts that summarize resource requests. For Operations and Grants-in-Aid for Airports (AIP), the inserts show the total resources for that appropriation that support the Global Connectivity Goal. For Facilities and Equipment (F&E), the funding requested for the individual program is provided.

Summary Budget Request

The FAA's request for $68.7 million to support Global Connectivity activities allows the agency to maintain its leadership role in global aviation. The request supports expanded global presence, training and technical assistance to foreign aviation authorities, and maintenance of aircraft certification work.

The FAA plans to focus resources to provide training and technical assistance to help foreign civil aviation authorities comply with international aviation safety standards. Specifically, FAA plans to partner with key partner countries in global aviation safety initiatives; administer programs that promote arranging commitments for international aviation infrastructure and capacity projects; and maintain FAA's ability to rely on the safety oversight and certification activities performed by other aviation authorities by concluding or expanding additional bilateral agreements.

Another focus of FAA's technical assistance effort is to support an interoperable and seamless global aviation system based on common use of the latest technologies. Such a system will not only be safer, but also more efficient.

Table 1 provides the Summary Budget Request and Table 2 outlines the discretionary increase request for Global Connectivity.

Table 1. Total Global Connectivity Budget Request

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2008 ACTUAL	FY 2009 ENACTED (OMNIBUS)	FY 2010 REQUEST	
Conclude Bilateral Aviation Safety Agreements and Expand the Use of NextGen Systems or Concepts in Priority Countries [1]				
Operations	57,587	43,637	48,512	[2]
AIP	190	200	390	
Subtotal	**57,777**	**43,838**	**48,901**	
FTE	**311**	**250**	**260**	
Secure a Yearly Increase in External Funding for Global Safety Initiatives (FY 2009 only)				
Operations		18,505		
Subtotal		**18,505**		
FTE		**66**		
Promote International Aviation Development Projects (FY 2010 only) [3]				
Operations			18,964	
Subtotal			**18,964**	
FTE			**66**	
FAA's Procurement Goals for Disadvantaged and Women-Owned Businesses				
Operations	553	725	840	
Subtotal	**553**	**725**	**840**	
FTE	**4**	**3**	**3**	
Global Connectivity $ Total	**58,330**	**63,068**	**68,706**	
Global Connectivity FTE Total	**315**	**319**	**329**	

[1] For FY 2008, only the BASA measure was included in the budget, but the allocation for this measure included funding for External Funding and NextGen. External Funding was allocated separately beginnning in FY 2009, reducing the total funding allocated here, while BASAs and NextGen remained combined. The BASA measure was discontinued in FY 2010 - funding for BASA-related activities remains combined with NextGen.

[2] Changes for FY 2010 from FY 2009 levels are due to the increased allocation of ATO operations funding to support the international NextGen program and performance measure. For more information, see the Overview and Budget Request section on pages 4 through 6.

[3] This measure replaces External Funding, but since the measures are equivalent, the allocation of resources remains unchanged.

Table 2. Discretionary Increase Request

	($000)	FTE
GRANTS-IN-AID FOR AIRPORTS		
Office of Airports		
International Aviation Specialist	180	0.5
GRANTS-IN-AID FOR AIRPORTS TOTAL	***180***	***0.5***
TOTAL	***180***	***0.5***

Performance Measure: Expand the Use of NextGen Performance-Based Systems or Concepts to Priority Countries

This funding request contributes to the DOT Global Connectivity strategic goal and the NextGen Technologies performance measure, and promotes seamless operations around the globe in cooperation with bilateral, regional, and multilateral aviation partners. Beginning in FY 2010, ATO will use significantly higher levels of Operations funding to support these efforts, more than doubling its total contributions from this appropriation to FAA's international aviation program. Additional elements of this program are described below and in the Overview and Budget Request Justifications on pages four through six.

The FAA computes its performance outcome through a count of the countries engaged with the agency in technical assistance programs or general cooperation that have achieved significant implementation milestones on NextGen technologies, procedures, or concepts.

Funding under this measure also supports vital international aviation programs that do not directly contribute to the achievement of the NextGen Technologies performance target. These initiatives include the agency's efforts to conclude bilateral aviation safety agreements (BASA), Aviation Safety's ongoing partnership with China, and the Office of Airports' technical assistance programs funded under the AIP appropriations.

Table 3. Number of priority countries taking a significant step, as a result of FAA assistance and collaboration, to implement the operational use of NextGen technologies, procedures, or concepts.

	2005	2006	2007	2008	2009	2010
Target:	1	1	1	1	1	1
Actual:	1	1	1	2	N/A	N/A

Note: New measure in FY 2006 – 2011 DOT Strategic Plan, reported in FY 2009 budget for the first time. Measures expansion of NextGen technologies into priority countries – target is one country per year. Similar measure included in *FAA Flight Plan*, originally called NAS Technologies. Redefined in FY 2006 to restrict measure to GPS-based technologies only, refocused in FY 2007 to include all NextGen-related projects. Targets shown for FY 2005 and FY 2006 are for original measures.

Table 4. Budget request for supporting Expand NextGen Technologies performance measure.

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2008 ACTUAL	FY 2009 ENACTED (OMNIBUS)	FY 2010 REQUEST
Global Connectivity			
Conclude Bilateral Aviation Safety Agreements and Expand the Use of NextGen Systems or Concepts in Priority Countries [1]			
Operations	57,587	43,637	48,512 [2]
AIP	190	200	390
Total	**57,777**	**43,838**	**48,901**
FTE	**311**	**250**	**260**

[1] For FY 2008, only the BASA measure was included in the budget, but the allocation for this measure included funding for External Funding and NextGen. External Funding was allocated separately beginnning in FY 2009, reducing the total funding allocated here, while BASAs and NextGen remained combined. The BASA measure was discontinued in FY 2010 - funding for BASA-related activities remains combined with NextGen.

[2] Changes for FY 2010 from FY 2009 levels are due to the increased allocation of ATO operations funding to support the international NextGen program and performance measure. For more information, see the Overview and Budget Request below.

Performance Overview

Expand NextGen Technologies

FAA works with international civil aviation authorities, organizations and other countries, to enhance its international leadership role and ensure harmonization of NextGen technologies, systems, procedures, and concepts with global air traffic management (ATM) modernization efforts. Global harmonization of NextGen with existing and proposed international ATM modernization initiatives is imperative to realizing full air navigation service provider potential safety, capacity and efficiency benefits across flight information region boundaries. NextGen global harmonization is also important for U.S. carriers flying within the global aviation system and U.S. citizens traveling abroad on foreign flag carriers.

Proper and timely coordination of NextGen planning, development, and implementation activities with key global partners, users, and stakeholders is imperative if the United States is to create a truly seamless future air transportation system. A seamless air transportation system is necessary to safely and efficiently handle the expected increase in air traffic operations in the next 5, 10, and even 20 years.

Funding of NextGen international coordination and harmonization activities, as defined in FAA's *Flight Plan's* NextGen Technologies performance target, is key to FAA's use of NextGen as the foundation to handle future aviation requirements by the world community. Support is also key to coordinate advanced and accelerated development and approval of global aviation Standards and Recommended Practices (SARPs) with the NextGen Implementation Plan and key milestones for operational capabilities. This funding will promote technologies such as Automatic Dependent Surveillance-Broadcast, Global Positioning System (GPS) -based procedures and navigation. Additional benefits of Performance Based Navigation, Air Traffic

Flow Management techniques and other oceanic and domestic operational efficiency improvement procedures that support the NextGen Vision are environmentally friendly and fuel efficient outcomes.

Bilateral Aviation Safety Agreements (BASA)

Through FY 2008 DOT's Strategic Plan and FAA's *Flight Plan*, as well as the FY 2009 President's Budget, included a BASA performance measure that tracked the number of agreements concluded each year. However, the measure has been discontinued in the FAA's *Flight Plan* and in the FY 2010 President's Budget due to difficulty associated with setting long-term targets for completed agreements. Despite this, significant resources remain devoted to FAA's efforts to reach bilateral agreements as a critical component of the agency's international technical assistance program.

A BASA is a government-to-government commitment intended to promote aviation safety and environmental quality and to enhance cooperation and increase the safety and efficiency of respective aviation systems. By helping to build a network of competent civil aviation authorities and concluding agreements with additional countries or regional authorities, FAA can have a significant impact on improving global understanding of U.S. safety regulations, leading to more consistent international oversight.

With the increasing globalization of aircraft manufacturing and air carrier operations, the interdependency between the U.S. and the foreign aviation sector is outpacing the agency's ability to conduct oversight throughout the globe. Since BASAs are based on the recognition of comparability between U.S. and foreign oversight systems, they allow FAA to rely on the safety oversight capabilities and technical expertise of other civil aviation authorities, thereby minimizing duplication of efforts as well as freeing resources to support U.S. safety priorities.

Budget Request Justification

NextGen and Air Traffic Technical Assistance Programs
(Operations, Air Traffic Organization, $8.5 million, 28 FTE)

ATO provides leadership, technical assistance, and support to the global civil aviation community, its air navigation service providers, civil aviation authorities, and airspace users in an effort to increase the overall safety, capacity and efficiency of global air operations. This assistance is based on current technologies, systems, procedures, and concepts that are either in operational use today in the U.S. National Airspace System (NAS) or are in the planning and development stages in support of the transition to the NextGen vision.

Further, the leadership, technical assistance, and support is focused on support to the International Civil Aviation Organization (ICAO) and its regional planning and implementation groups and members States, as well as key regional and multilateral aviation coordination groups. In this way FAA provides expertise on the implementation of communication, navigation and surveillance, and air traffic management technologies to harmonize and standardize regional implementations with FAA's current and planned operations for the United States. Specific bilateral assistance is also provided to strategic countries or entities that have major influence on the aviation landscape within their regions. Examples of this include the established assistance, coordination and harmonization relationships with Europe (Eurocontrol), Civil Air Navigation Service Organization (CANSO), Japan, Brazil, China, India and North America (Canada and Mexico).

Aviation Safety Leadership
(Operations, Aviation Safety, $34.4 million, 210 FTE)

The FAA continues to focus efforts on its partnership with China. In FY 2008, China implemented 5 additional Safety Enhancements for a total of 15 of 27 Commercial Aviation Safety Team (CAST) Safety Enhancements. These Safety Enhancements are designed to mitigate major known causal factors of accidents, focusing on the most disastrous accidents: Controlled Flight into Terrain (CFIT) and mid-air collisions. These safety enhancements have proven effective in the United States in reducing commercial air carrier accidents. These efforts will enhance China's ability to maintain its excellent safety record as it expands its aviation system in the future.

Negotiating Bilateral Safety Agreements
(Operations, International Aviation, $538,000, 2 FTE)

The U.S. Department of State leads the negotiation of the BASA with foreign governments or their civil aviation authorities and FAA coordinates with them. These agreements have two components: executive agreements and implementation procedures. The executive agreement is signed by the U.S. Department of State and the target country's Ministry of Foreign Affairs. It lays the essential groundwork for cooperation between the two governments and their respective aviation authorities. Once the executive agreement is concluded, FAA negotiates implementation procedures (IPs) with the partner civil aviation authority. The IPs provide detailed operational safety and certification arrangements between FAA and the foreign civil aviation authority. The IPs are the operational portion of the bilateral agreement that allow for acceptance of aviation goods and services between the two countries.

Supporting Bilateral Safety Agreements
(Operations, Aviation Safety, $34.4 million, 210 FTE)

The FAA conducts certification activities in accordance with the terms of final bilateral agreements. This includes validations of design approvals, certification of repair stations on behalf of other countries and the preparatory work leading to the acceptance of another country's regulatory oversight system (bilateral technical evaluations).

Airport Technical Assistance
(Grants-in-Aid for Airports, Office of Airports, $390,000, 3.5 FTE)

Under the Grants-in-Aid for Airports account, FAA provides technical assistance when requested to help countries improve airport safety and environmental stewardship. Assistance is provided to improve runway safety, develop airport certification and inspection programs, and implement airport safety management systems to meet ICAO requirements Technical assistance is also provided to help countries reduce the hazard from bird strikes near airports, educate countries about environmental initiatives and technologies, and anticipated NextGen benefits at airports in the United States. This funding also covers time and travel for technical experts to participate in ICAO panels and work groups, conduct airport safety assessments for foreign airports, and to conduct training seminars.

Discretionary Increase: International Aviation Specialist
(Grants-in-Aid for Airports, Office of Airports, $180,000, 0.5 FTE)

ARP requires one position (0.5 FTE) and $100,000 for international travel support. The ARP international workload continues to escalate and it is essential that an international aviation specialist is available support the efforts. ARP is required to attend meetings of the ICAO Aerodrome panel to promote U.S. positions on technical standards at ICAO. Responsibilities in support of these meetings include workgroups on visual aids, airport design, aircraft rescue and firefighting, heliport design, and pavement design. In addition, ARP must attend regional ICAO Director General Meetings to help promote airport and runway safety. The aviation specialist will coordinate all our international activities, prepare responses to request for technical assistance, and support international travel for the Associate Administrator for Airports.

Performance Measure: Promote International Aviation Development Projects

This funding request contributes to DOT's Global Connectivity strategic goal and promotes improved safety and regulatory oversight in cooperation with bilateral, regional, and multilateral aviation partners. The success of these efforts is measured in terms of the number of critical aviation infrastructure and capacity projects for which external funding is arranged. This measure replaces the External Funding measure and focuses on the total amount of funding rather than the number of projects for which funding was arranged – thereby eliminating the distortion caused by large, one-time programs.

Table 5-A. Number of international aviation development projects for which funding is arranged from the U.S. and international governmental organizations, multilateral banks, and industry.[1]

	2005	2006	2007	2008	2009	2010
Target:	N/A	N/A	N/A	N/A	7	7
Actual:	N/A	N/A	N/A	N/A	N/A	N/A

Table 5-B. Yearly increase in international aviation development funding from the U.S. and international governmental organizations, multilateral banks, and industry.

	2005	2006	2007	2008	2009	2010
Target:	$14.36M	$23.41M	$12.00M	$15.00M	$18.00M	$21.00M
Actual:	$19.51M	$33.04M	$13.36M	$16.70M	N/A	N/A

[1] New metric to replace External Funding beginning in FY 2009. Through FY 2010, targets and results for both measures will be reported.

Table 6. Budget request for supporting International Aviation Development Projects.

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2008 ACTUAL	FY 2009 ENACTED (OMNIBUS)	FY 2010 REQUEST
Global Connectivity			
Secure a Yearly Increase in External Funding for Global Safety Initiatives (FY 2009 only)			
Operations		18,505	
Total		**18,505**	
FTE		**66**	
Promote International Aviation Development Projects (FY 2010 only)			
Operations			18,964 *
Subtotal			**18,964**
FTE			**66**

[3] This measure replaces External Funding, but since the measures are equivalent, the allocation of resources remains unchanged.

Performance Overview

Often countries that could benefit the most from aviation technical assistance are the least able to afford it. While the FAA has no grant program to finance international safety and capacity efforts, it seeks to leverage the resources the agency is able to contribute by implementing a methodology to increase intellectual and financial assistance from U.S. Government organizations, multilateral banks, and industry. New sources of external funding are critical in supporting FAA's efforts to maintain its role as a global leader in aviation safety standards and procedures.

From FY 2004 – 2008, the FAA used a performance measure based on the amount of external funding secured for international aviation infrastructure and capacity-building projects. Although the target was met every fiscal year, the measure did not demonstrate the actual benefits and outcomes the program made to global aviation development. The new International Aviation Development Projects performance measure reflects FAA policy objectives. The measure places importance on work accomplished and the number of countries and regional organizations assisted, displaying international involvement and outreach.

Budget Request Justification

Technical assistance and training improve aviation safety abroad and are at the very core of FAA's international programs. A primary focus of this effort is to transfer knowledge and skills to help developing countries comply with international aviation safety standards. The FAA's *Flight Plan* performance target is to promote international aviation development projects to address critical aviation needs in cooperation with bilateral, regional and multilateral partners. The agency plans to arrange sources of funding for at least 7 international aviation development projects annually from FY 2009 – FY 2013.

Promoting International Aviation Development Projects
(Operations, International Aviation, $17.8 million, 63 FTE)

The Office of International Aviation (API) has responsibility for achieving the *Flight Plan* Performance Target for international aviation development projects. More specifically, the International Policy staff is responsible for overall management of the international aviation development projects program, including developing plans, coordinating the efforts of all participants, building good working relationships with donor organizations, tracking progress toward the *Flight Plan* Performance Target, and developing reports for presentation to senior management.

API regional offices are responsible for identifying promising aviation infrastructure and capacity-building projects, working with other FAA organizations, host countries and other foreign governments to develop project proposals, and then presenting those proposals to potential donor organizations. Once project proposals are approved, the API regional offices develop agreements with the donor organizations. The API staff strengthens cooperative ties to donor organizations through individual contacts and sponsorship of events to promote funding of aviation safety as a key contributor to economic development.

Establishing Technical Assistance Agreements
(Operations, International Aviation, $17.8 million, 63 FTE)

The agency plans to focus additional resources to provide training and technical assistance to help foreign civil aviation authorities meet international standards. Specifically, FAA plans to expand technical assistance and training to key partner countries and maintain FAA's ability to rely on the aircraft certification work performed by other civil aviation authorities around the world.

FAA's Procurement Goals for Disadvantaged and Women-Owned Businesses

Table 7: Budget Request for supporting FAA's Procurement Goals

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2008 ACTUAL	FY 2009 ENACTED (OMNIBUS)	FY 2010 REQUEST
Global Connectivity			
FAA's Procurement Goals for Disadvantaged and Women-Owned Businesses (FY 2008 & FY 2009)			
Operations	553	725	840
Total	**553**	**725**	**840**
FTE	**4**	**3**	**3**

While FAA does not contribute directly to DOT's Disadvantaged and Women-Owned Businesses performance goal, the agency does have its own related targets. The Office of Civil Rights manages DOT's Disadvantaged Business Enterprise (DBE) program for FAA. The DBE program requires recipients of federal financial assistance to establish goals for the participation of disadvantaged entrepreneurs and certification of the eligibility of DBE firms to participate in DOT contracts and airport concessions.

The FAA's DBE program requires approximately 300 primary and 560 non-primary airports to set contracting goals for socially and economically disadvantaged firms. Approximately 300 primary airports must set concession goals as well.

Although the actual FY 2008 DBE accomplishments will not be known until June 1, 2009, data collected to date indicates DBE prime and sub-contractors grossed at least $200 million, which equates to 15.7 percent of 2008 Airport Improvement Program contract projects; DBE concessionaires (excludes car rental concessionaires) grossed at least $912.1 million in revenue, which equates to 23.5 percent of 2008 concession gross receipts; and car rental DBE concessionaires' gross receipts to date are at least $91.2 million. FAA expects these FY 2008 DBE statistics will continue to rise as completed data is submitted by airport sponsors.

In FY 2007, DBE prime and sub-contractors grossed $224.9 million, which equates to 11.5 percent of all 2007 Airport Improvement Program contract projects. DBE concessionaires (excludes car rental concessionaries) grossed $15 billion in revenue, which equates to 23 percent of all concession gross receipts; and car rental DBE concessionaires' gross receipts were $219.8 million.

The FAA's Major Procurement Program Goal (MPPG), i.e. FAA's Small Business Development Program is managed by the agency's acquisition executive. In FY 2009, FAA anticipates awarding $2 billion in Direct Procurements. The FAA's FY 2009 MPPG for Contracts Awarded to Small Business Concerns Owned and Controlled by Socially and Economically Disadvantaged Individuals (which includes 8-A) is 10 percent of total direct procurement dollars, though the actual accomplishment will not be known until the first quarter of FY 2010. This goal will remain at 10 percent until the fourth quarter of FY 2010 when goals for FY 2011 will be determined.

The FAA's MPPG for women-owned small businesses is also managed by the agency's acquisition executive. In FY 2009, the goal is five percent of total direct procurement dollars. The Women-Owned Businesses direct procurement goals for FY 2010 and 2011 will remain at five percent.

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ENVIRONMENTAL STEWARDSHIP

Introduction

Improving environmental protection and addressing the energy challenge are vital elements to ensure continued U.S. air transportation viability and global leadership. The overarching environmental goal for NextGen is *environmental protection that allows sustained aviation growth*. Despite the downturn in aviation activity experienced in 2008 – 2009, environmental and energy pressures on the national and international aviation system remain and will continue to increase as growth in aviation activity returns. The primary environmental and energy issues that will significantly influence the future capacity and flexibility of the national airspace system (NAS) are aircraft noise, air quality, global climate effects, energy availability, and water quality.

The FAA is committed to managing aviation's growth in an environmentally sound manner and has an aggressive plan to accomplish this objective through policies, mitigation, operational measures, measurements and standards, and research and development. A strategic environmental management system (EMS) approach will provide the foundation for integrating environmental and energy objectives into the planning, decision-making, and operation of NextGen. EMS will be used to manage the environmental and energy aspects of NextGen. The implementation of EMS by organizations contributing to NextGen will play an important role in achieving the environmentally sustainable growth of air transportation.

If FAA is to effectively tackle environmental and energy challenges, the agency must maintain its investments in Research, Engineering, and Development (RE&D), Operations, NextGen Facilities and Equipment (F&E) funds for environment, and Grants-in-Aid for Airports (AIP). The agency expects environmental and energy issues to become increasingly difficult over the time period of the current *Flight Plan* (2009-2013). Continuing efforts to reduce aircraft noise exposure mitigate all types of aviation emissions, and addressing aviation's contribution to climate change and energy consumption will be critical to ensuring the necessary capacity growth in the NAS. In particular, aviation greenhouse gas impacts have become the subject of increasing concern, especially on the international stage.

Organization

The FAA's *Flight Plan* does not include a distinct environmental strategic goal. Environmental performance targets in the *Flight Plan* are linked to the Capacity goal (the equivalent to DOT's Reduced Congestion strategic goal) and reflect FAA's commitment to increasing the capacity of the NAS in an environmentally sound manner. For purposes of this performance budget, FAA programs that contribute to the DOT-level Environmental Stewardship goal are presented in this section. These programs are organized by the performance targets they support.

Narrative sections begin with a resource request summary for the organization involved. The summaries for activities in each goal section funded by Operations and AIP present the total amount assigned to that goal for the organization. For F&E the inserts show resources for selected individual programs, including NextGen funding. The resources shown for RE&D include the Reduce Environmental Impacts and NextGen programs and a share of Mission Support funding.

Table 1 below summarizes the Environmental Stewardship budget request. Table 2 provides the discretionary increase budget request by allocation. Exhibits IV-1 at the beginning of this section and II-3 in Section 2 provide additional details.

Summary Budget Request

This request seeks a total of $494.3 million to support FAA's contributions to DOT's Environmental Stewardship strategic goal, and the performance measures for reduced aviation noise exposure, DOT facilities cleanup, and streamlined environmental reviews. Funding will also support the FAA *Flight Plan* performance target to improve aviation fuel efficiency.

During the formulation of this request, ATO undertook a review of its method for allocating resources to DOT goals, comparing previous budget submissions with its Business Plans. In order to better align its zero-based budget with its plans, the organization has made bookkeeping revisions to its goal allocations for FY 2010. In order to correctly allocate resources to significant environmental work being done in the ATO Technical Operations Service Unit, funding was moved to Environmental Stewardship from the Safety goal area. This shift does not reflect actual changes from FY 2009 in ATO programs or priorities. They have no substantive impact on any activities associated with the goals.

Table 1. Total Environmental Stewardship Budget Request

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2008 ACTUAL	FY 2009 ENACTED (OMNIBUS)	FY 2010 REQUEST	
Reduce Exposure to Aircraft Noise				
Operations	16,745	17,849	20,422	
RE&D	15,786	32,657	36,070	
AIP	210,498	288,581	288,900	
Subtotal	**243,030**	**339,087**	**345,392**	
FTE	**155**	**164**	**174**	
Streamline the Completion of Environmental Reviews				
AIP	34,874	46,406	46,551	
Subtotal	**34,874**	**46,406**	**46,551**	
FTE	**44**	**46**	**46**	
Increase the Percentage of Facilities Categorized as No Further Remedial Action Planned				
Operations	9,583	9,834	70,856	*
F&E	29,498	28,964	31,529	
Subtotal	**39,081**	**38,798**	**102,385**	
FTE	**30**	**72**	**1,163**	
Environmental Stewardship $ Total	**316,985**	**424,291**	**494,328**	
Environmental Stewardship FTE Total	**229**	**282**	**1,383**	

* Changes for FY 2010 from FY 2009 levels are due to bookkeeping revisions in the ATO zero-based budget resulting from efforts to align business planing and budget goal allocation methods. These changes have no substantive impact on the requisite activities associated with this goal. For more information, see the Summary Budget Request Section above.

Table 2. Discretionary Increase Requests

	($000)	FTE
OPERATIONS		
Policy, Planning and Environment		
NextGen Environmental/Noise/Congestion Studies	1,881	8.0
OPERATIONS TOTAL	***1,881***	***8.0***
TOTAL	***1,881***	***8.0***

Performance Measure: Reduce the Number of People Exposed to Significant Aircraft Noise

This funding request for $345.4 million will contribute to DOT's Environmental Stewardship strategic goal and to FAA's Reduced Aircraft Noise Exposure performance measure. The performance history and targets are displayed in Table 3. Table 4 summarizes the budget resources requested.

Table 3. Cumulative percent reduction in number of people exposed to significant aircraft noise levels

Noise Exposure: **Percent reduction in the number of people in the U.S. who are exposed to significant aircraft noise levels**						
	2005	**2006**	**2007**[2]	**2008**	**2009**	**2010**
Target	-3%	- 4%	- 8%	- 12%	- 16%	-20%
Actual	-35%[1]	-36%[1]	-37%[1]	-38%[3]	N/A	N/A

1 Revised from original result due to improvement in noise exposure model in FY 2008.
2 The target was revised in FY 2007 from a 1% annual decrease from the baseline to a 4% decrease, lowering the cumulative target for FY 2007 from 5% to 8%.
3 Projection from trends, to be revised in May 2009.

Table 4. Budget Request for Reducing Exposure to Aircraft Noise

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2008 ACTUAL	FY 2009 ENACTED (OMNIBUS)	FY 2010 REQUEST
Environmental Stewardship			
Reduce Exposure to Aircraft Noise			
Operations	16,745	17,849	20,422
RE&D	15,786	32,657	36,070
AIP	210,498	288,581	288,900
Total	**243,030**	**339,087**	**345,392**
FTE	**155**	**164**	**174**

Performance Overview

Public concern and sensitivity to aircraft noise around airports is high. In recent years, noise complaints have increased even while quieter aircraft technology has been introduced. Aircraft noise is an undesired by-product of mobility, and the government acts to reduce the public's exposure to significant noise levels.

Currently, the actual number of residents exposed to significant noise remains well below the current target. This is a result of federally mandated phase-out of Stage 2 aircraft, the market-driven retirement of older, less fuel efficient Stage 3 aircraft after September 11, operational changes, and the current national economic downturn and financial condition of the airline industry. Noise compatibility projects funded under AIP further contributed to the reduction in noise exposure levels. While FAA expected that these trends would reverse, that has not occurred.

This continued gap between actual and target noise exposure required a re-examination of the current noise exposure target and an examination of the long-term trends in noise exposure. In FY 2007, FAA increased its noise exposure target from a one percent to a four percent reduction per year in the number of people exposed to significant noise. Performance will continue to be measured using a three-year moving average from the base average years, 2000 to 2002. This is closer to the historical rate of change and incorporates the experience of the last few years. The FAA will continue to monitor the trends in noise exposure and will review this target after its reauthorization proposal has been acted on and its work on environmental trends in the NextGen system has been further refined.

While new aircraft noise standards and the introduction of newer quieter aircraft will provide for continuing reduction of aircraft source noise over time, AIP-funded airport noise compatibility projects and improvements in operational procedures will be the principal means to mitigate significant aircraft noise exposure in the near term.

Airport noise compatibility projects identify airport-specific noise impacted areas and noise mitigation measures. Mitigation measures normally include residential and educational building soundproofing, land-use planning strategies, and relocation of residences and buildings used primarily for educational or medical purposes. In addition, passage of FAA's reauthorization and the FY 2010 President's Budget will further advance research to develop additional approaches to noise mitigation. These approaches include new engine and airframe technologies and air traffic procedures that employ the advanced avionics capabilities of modern aircraft to reduce noise in both arrival and departure procedures.

Authority and funding to FAA to accelerate the implementation of new air traffic procedures and new aircraft emissions and noise technology are badly needed. Without these programs, there is little prospect for the type of fleet and performance change required to meet either the current target or historic experience.

Initial analysis by the Joint Program Development Office of environmental trends based on expansion of the NAS indicates that noise exposure is likely to move upwards over the next 10 years as traffic growth continues and population grows, even taking into account forecasted fleet changes and some implementation of new air traffic procedures. This analysis shows it could prove problematic to meet the current 4 percent reduction goal or the historic five percent rate, over time.

Also, as FAA takes a more integrated approach to environmental regulation – assessing the relative cost-benefit tradeoffs of reductions in noise, air quality, and greenhouse gas emissions – it remains unclear at this point what the relative importance of noise vs. emissions will be in the future. While aviation noise continues to be the primary environmental focus of airport communities, air quality and climate impacts are becoming increasing concerns.

Stricter ozone and particulate matter standards under the Clean Air Act have resulted in local authorities and environmental groups calling for action from federal agencies and air carriers to mitigate precursor emissions that contribute to ozone and particulate matter. Local worries about the environmental impact of these emissions can impede capacity growth and undermine the efficiency of the NAS. Airports located in air quality nonattainment or maintenance areas increasingly find that air emissions add to the complexity, length, and uncertainty of the environmental review and approval of expansion projects.

Added to worries about regional air quality, the potential effects of aircraft emissions on the climate of our planet may be the most serious long term environmental issue facing the aviation industry. Taken as a whole, aviation emissions could succeed noise as the major impediment to aviation's future growth and development.

AIP and RE&D investment must be continued in FY 2010 if improvements are to be sustained. These resources are essential to further understand and reduce noise exposure. With these resources, the agency will continue to fund:

- Noise Compatibility Program recommendations such as soundproofing of residences and buildings intended primarily for educational or medical purposes, land acquisition and relocation, the purchase of buffer zones around airports, and land use planning.
- RE&D investment to: refine assessment methodologies and develop new metrics and better procedures for dealing with environmental issues; develop and mature technology and operational approaches to mitigate aviation's environmental impact at the source; research to better characterize the impacts of noise and emissions and to develop abatement operational procedures; and develop noise and emissions research and assessment technologies.
- Increases in efforts to leverage greater academic, industry, and research organization resources and efforts through the Partnership for AiR Transportation Noise and Emissions Reduction (PARTNER) Center of Excellence.
- AIP noise set-aside for Voluntary Airport Low Emission Program (VALE) eligible projects. This program has evolved into a permanent national program, for airport low emission technologies. As a result, both noise and emissions projects are eligible for AIP funding.
- Implement operational flight control measures to help reduce exposure to noise, while decreasing emissions and fuel burn.

Further, passage of the NextGen reauthorization proposal and associated RE&D and F&E funding will expand FAA's environmental research programs and allow the agency to:

- Implement a research consortium to accelerate the maturing of lower energy, emissions, and noise technology and alternative fuels for aircraft.
- Identify and demonstrate how advances in communication, navigation and surveillance technology can be leveraged to optimize airport and airspace throughput and reduce noise, fuel burn and emissions[1].
- Determine the appropriate metrics to manage aviation environmental impacts that are needed to allow growth in capacity.
- Reduce or limit the impact of aviation greenhouse gas emissions on the global climate.
- Implement environmental management system at enterprise and organizational level to manage environmental impacts of aviation[1].
- Improve NAS energy efficiency and reduce congestion to abate adverse effects on fuel burn and emissions.
- Determine and develop NAS infrastructure adaptation necessary to adopt new environmental technologies and alternative aviation fuels[1].
- Develop airspace analytical tools for aviation noise and emissions impacts, and analysis of costs/benefits of mitigation techniques[1].

Environmental Research and Airport Development

The Airport Cooperative Research Program (ACRP) within the Office of Airports (ARP) conducts airport-related research, including research on environmental issues. The ACRP was authorized at $10 million per year in Vision 100. The agency works with aviation associations and the Transportation Research Board to implement the program. For FY 2010, the agency's reauthorization proposal recommends adding $5 million to fund the expansion of ACRP's environmental research studies. Environmental issues impact every aspect of airport operations, and additional research is needed in order to plan for, study, and mitigate the impact future environmental requirements will place on airports.

[1] This effort is a subcomponent of the $48.3 million NextGen System Development budget line item in ATO Facilities and Equipment, all the resources for which are allocated to the Safety goal.

Budget Request Justification

Setting Standards and Providing Oversight
(Operations, Office of Policy, Planning and Environment, $8.1 million, 41 FTE)

The FAA has a role in developing national aviation environmental and energy policy. This policy addresses the full spectrum of environmental aspects of FAA actions, including aircraft noise and exhaust emissions and energy conservation. The agency develops regulations and standards as appropriate to meet statutory requirements or DOT and agency policy. The FAA also collaborates with other federal agencies to develop policies and coordinates community, state, local, and general public participation in the resolution of environmental and energy matters.

In FY 2010, the agency will work with local communities and the national and international aviation community toward balanced approaches that reduce aviation noise and emissions. The agency will ensure timely review of planning and environmental efforts at all 35 Operational Evolution Partnership (OEP) airports examining new runway and airfield configurations. The FAA will also develop best practices for managing relations with the airport and aviation industry and for informing the public about aviation and the environment. Congestion-reducing measures will provide complementary environmental benefits. In addition, FAA will continue to ensure that international environmental standards adopted by the International Civil Aviation Organization are globally and uniformly applied, reflect the best available technology, provide real environmental benefits, and are economically sound. Finally, FAA will continue leadership of environmental strategy development and implementation for the NextGen Plan.

Discretionary Increase: NextGen Environmental/Noise/Congestion Studies
(Operations, Office of Policy, Planning and Environment, $1.9 million, 8 FTE)

This funding is requested to support the implementation of NextGen. A strategic EMS approach will provide the foundation for integrating environmental protection objectives into the core business and operational strategies of NextGen and guide continual improvements in environmental protection to achieve sustained aviation growth. An aviation environmental and energy policy will establish the basic framework for NextGen environmental protection and energy conservation. Assessment and development of national policy that targets NextGen efficiencies will enable the FAA to fully utilize NextGen capabilities to minimize congestion and delays in the air traffic system.

The additional resources will support efforts to:

- Reduce aviation's effect on the global climate and support the development and accelerated integration of environmentally-beneficial operational procedures to reduce aviation's environmental footprint, while meeting NAS capacity and efficiency needs in coordination with ATO.
- Support the streamlining of environmental reviews for NextGen airport capacity and airspace redesign projects, while improving environmental protection.
- Conduct studies on evolving non-traditional noise issues facing NextGen, support the environmental management system strategy to integrate environmental protection objectives into the core business and operational strategies of NextGen, and develop and analyze congestion and delay mitigation initiatives focusing on NextGen capabilities.

Funding is also requested to provide contractor support for NextGen implementation efforts, including the development of environmental management systems for NextGen programs, support for evolving non-traditional noise issues (e.g., supersonic), and criteria for federal intervention to enhance FAA technical capabilities. These activities will help the agency integrate evolving environmental protection and congestion mitigation initiatives into the NAS, thereby reducing aviation's environmental footprint while meeting near-term NAS capacity and efficiency needs.

Developing Methodologies, Models, Metrics and Tools to Assess and Mitigate Environmental Impacts (Research, Engineering & Development, $15.5 million)

Aerospace systems have been designed, and regulations for their certification and use, have historically been written as though aviation noise and various emissions had nothing to do with one another. However, aviation noise and emissions are highly interdependent phenomena. Future environmentally responsible aviation policy and rulemaking must be based on a new, interdisciplinary approach that is as affordable as it is effective.

Existing analytical tools are inadequate to assess interdependencies between noise and emissions or analyze the cost/benefit of proposed actions. Accordingly, in FY 2010 FAA will continue to develop a robust new comprehensive framework of aviation environmental analytical tools and methodologies to perform these functions. The long-term aim is to provide a seamless, comprehensive set of tools to address all aspects of noise and emissions. The elements of this framework include:

- Environmental Design Space (EDS) capability to provide integrated analysis of noise and emissions at the aircraft level.
- Aviation Environmental Design Tool (AEDT) capability to generate interrelationships between noise and emissions and among emissions at the local and global levels.
- Aviation Portfolio Management Tool (APMT) capability to provide the common, transparent cost/benefit methodology needed to optimize national aviation policy in harmony with environmental policy.

The FAA's development of these tools will allow:

- Government agencies to understand how proposed actions and policy decisions affect aviation noise and emissions.
- Industry to understand how operational decisions affect proposed projects.
- The public to understand how actions by government and industry affect aviation noise and emissions.

The FAA will also continue activities through the PARTNER Center of Excellence to identify and better measure the issues and impacts associated with aircraft noise and aviation emissions, and generate improved solutions to deal with these problems. Further, the agency will continue its efforts to maintain the currency of regulation and technical guidance materials concerning aircraft noise and engine exhaust emissions certification requirements.

Programs Advancing NextGen Environmental Research

Continuous Low Energy, Emissions, and Noise (CLEEN) Technologies and Metrics and Impacts for NextGen (Research, Engineering & Development, $19.5 million)

Environmental issues have impacted airport and airspace growth over the past decade. Anticipated increases in air transportation demand will place significant environmental and energy pressures on various segments of the NextGen system. The primary environmental constraints on the capacity and flexibility of NextGen could be community noise, air quality, global climate impacts, and energy production and consumption. To ensure that environmental impacts do not constrain NextGen's growth, FAA must accelerate the introduction of quieter and cleaner technology in our fleets.

Ninety percent of the environmental improvements (noise and emissions reductions) in the aviation system in the last 30 years have come from improved technology. Without a pipeline of near term (5-10 years) technology improvements, the absolute reduction of significant noise and air quality impacts that are necessary to enable NextGen growth cannot be achieved. Robust research and development is needed to enable technology solutions to manage and mitigate environmental constraints. The goal is to have a fleet of quieter, cleaner aircraft that operate more efficiently with less energy.

In FY 2010, FAA will continue to support the Continuous Low Emissions, Energy and Noise (CLEEN) Technologies program to help achieve the NextGen goal of increasing capacity threefold while reducing significant environmental impacts in absolute terms. The program is focused on reducing current levels of aircraft noise and greenhouse gas emissions, improving air quality, and enabling the use of alternative fuels.

The NextGen environmental goal is to reduce significant health and welfare impacts of aviation community noise and air quality in absolute terms, notwithstanding growth. Although there is no quantitative goal for greenhouse gas emissions, the vision does call for limiting or reducing impacts and reducing uncertainties associated with these emissions to levels that enable appropriate action. Accordingly, there is a need to develop a robust science-based understanding of impacts of aviation emissions on earth's climate change and translate these impacts into improved metrics that can be used to better assess and mitigate aviation's contribution. In FY 2010, FAA will advance efforts to establish and implement metrics to better assess climate impacts from commercial aircraft operations.

NextGen Systems Development: Environmental Management System and Advanced Noise and Emissions Reduction (Facilities and Equipment, ATO, $7.0 million)[2]

The Environmental Management System and Advanced Noise and Emissions Reduction programs will help achieve the NextGen goal of increasing capacity while reducing significant environmental impacts in absolute terms. The program will focus on advancing, assessing and applying Environmental Management System (EMS) approaches for the management of environmental impacts of aviation growth. The program will also advance the NAS infrastructure adaptation required to adopt CLEEN technologies and alternative fuels. In addition, this program will explore and demonstrate significant advances in environmentally efficient aircraft operational procedures in order to reduce emissions and noise and increase in fuel efficiency.

The EMS and Advanced Noise and Emissions Reduction program will also provide sufficient knowledge to enable the development of approaches to mitigating aviation's effects on the environment which will be critical to the enhancement of capacity. To further these goals, the research planned for FY 2010 will:

- Evaluate the potential for NAS environmental benefits of new aircraft technologies and alternative fuels.
- Initiate a comprehensive analysis of the impact on the NAS of new aircraft types [e.g. aircraft featuring Continuous Low Emissions, Energy, and Noise (CLEEN) technologies, Very Light Jet (VLJ), Unmanned Aerial Vehicle (UAV), Supersonic Business Jet (SSBJ).
- Assess approaches to optimize environmental performance.
- Explore and demonstrate significant advances in environmentally and fuel efficient aircraft operational procedures.
- Initiate efforts to identify any NAS adaptation required to adopt new CLEEN technologies and alternative fuels.
- Define existing and planned environmental mitigation methods to counter NAS constraints of today and for NextGen.
- Apply metrics for health and human welfare and climate impacts to develop a sample NAS EMS and define benefits of mitigation actions.
- Expand EMS outreach program.
- Refine EMS framework and development of decision support tools.

Systems Development: NextGen Operational Assessment
(Facilities and Equipment, ATO, $3.0 million)[3]

The Environmental Assessment program under NextGen Operational Assessment will focus on environmental model advancements to assess mitigation options designed for reduction in noise and emissions and increases in fuel efficiency for NAS-wide system needed to meet NextGen environmental goals. Advances and application of environmental assessment capability will also help to identify relative benefits of optimally cost-beneficial solutions. Key activities under this program will help to advance development of local, regional, and NAS-wide scale environmental assessment capability to enable dynamic analysis and control of environmental impacts. In particular, FY 2010 activities will focus on development and evaluation of NextGen regional scale analysis capability in Aviation Environmental Design Tool (AEDT) and Aviation Portfolio Management Tool (APMT) as well as exploration of integration of these models with other NextGen NAS models developed under other solution sets.

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[2] This effort is a subcomponent of the $48.3 million NextGen System Development budget line item in ATO Facilities and Equipment, all the resources for which are allocated to the Safety goal. As a result, the $4 million budgeted for the program is not included in Tables 1 and 4 above. The funding is included in the total ATO Facilities and Equipment Program request supporting the Commercial Air Carrier Fatality Rate under Safety.

[3] This effort is also a subcomponent of the $48.3 million NextGen System Development budget line item in ATO Facilities and Equipment.

Supporting Noise Mitigation Efforts
(Grants-in-Aid for Airports, Office of Airports, $288.9 million, 36 FTE)

Much of the unwelcome noise generated by commercial aircraft is produced during takeoff and landing. Consequently, people living and working in proximity to major airports are exposed to the highest levels. Airports built decades ago in outlying rural areas now find themselves surrounded by suburban development. Further reduction in the exposure to excessive aircraft noise levels therefore requires significant investments in soundproofing of residences, businesses, and public facilities.

ARP assesses the environmental impacts of proposed airport projects submitted for AIP and Passenger Facility Charge (PFC) program funding or other approval, and provides technical and funding support to mitigate impacts. Noise is typically the impact of greatest concern, and the AIP and PFC programs provide funding to assist in abating the impacts of aircraft noise on individuals located around the airport. AIP and PFC funded Noise Compatibility Program Studies and National Environmental Policy Act documents identify recommendations for mitigation such as the purchase and relocation of residences and businesses, soundproofing of residences and buildings used for educational or medical purposes, and the installation of noise barriers or monitoring equipment.

Performance Measure: Streamlined Environmental Review of Transportation Infrastructure Projects

This performance target supports the achievement of DOT's strategic outcome of increased project review efficiency. The targets and results are reported for DOT as a whole, to which FAA contributes. Performance history and targets are displayed in Table 4. Table 5 summarizes the budget resources requested.

This request for $46.6 million in AIP funding will contribute to FAA's support of DOT and Vision 100 initiatives to streamline Environmental Impact Statements (EIS) for transportation infrastructure, safety and security projects, specifically through reduction of the time to complete reviews for airport projects funded by AIP grants and the PFC program. In FY 2006, ARP began developing criteria to measure the effectiveness and timeliness of reviews for airport development projects. The FAA created a new tracking database that includes EIS data extending back to FY 2002. The agency began reporting on the mean time to complete EISs for airport projects in FY 2008.

Table 5. Percentage reduction in median time (months) to complete Environmental Impact Statements

Streamline Environmental Impact Statements[1]: Median time in months to complete Environmental Impact Statements (EIS) for DOT-funded infrastructure projects						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	N/A	N/A	N/A	60	54	48
Actual	56	57	67	63.5[2]	N/A	N/A

[1] Targets and results are for DOT as a whole, FAA contributes.
[2] Preliminary estimate.

Table 6. Budget Request for Streamlining Environmental Reviews

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	**FY 2008 ACTUAL**	**FY 2009 ENACTED (OMNIBUS)**	**FY 2010 REQUEST**
Environmental Stewardship			
Streamline the Completion of Environmental Reviews (FY 2008 & FY 2009)			
AIP	34,874	46,406	46,551
Total	**34,874**	**46,406**	**46,551**
FTE	**44**	**46**	**46**

Performance Overview

The FAA has implemented environmental streamlining activities that encourage federal and state agencies to establish and meet timelines for airport projects that require an EIS. These initiatives support compliance with Executive Order (E.O.) 13274: "Environmental Stewardship and Transportation Infrastructure Project Reviews" and Vision 100: The Century of Aviation Reauthorization Act by overcoming obstacles early in the environmental review process. In support of these, the agency has promoted widespread implementation of environmental stewardship and promoted better integration of the planning and environmental review processes, leading to improved transportation decision-making.

The FAA's earliest initiatives to shorten the review of airport projects were outlined in the May 2001 report to Congress on the Environmental Review of Airport Development Projects. The FAA continues to actively implement the provisions of E.O. 13274 and Vision 100 legislation, along with other administrative provisions, in an effort to improve the efficiency of its environmental reviews. These provisions have resulted in the devotion of more environmental staff resources; utilization of best practices in a team approach to critical airport development projects; early initiation of environmental considerations in the planning process; streamlining of documentation requirements; improved and expedited interagency coordination through concurrent reviews, approvals, and permitting; and improved accountability for schedules and deadlines.

The requirements of the National Environmental Policy Act (NEPA) apply to a wide range of FAA actions, including environmental reviews required for the agency's capital improvement projects as well as those airport projects tracked by this performance measure. NEPA requires federal agencies to carefully consider and document the potential environmental impacts of proposed actions to ensure informed agency decision-making. To conform to regulations issued by the President's Council on Environmental Quality (CEQ), FAA has issued agency-specific NEPA compliance procedures in revised Orders 1050.1E - Environmental Impacts: Policies and Procedures and 5050.4B – NEPA Implementing Instructions for Airport Actions. These revised Orders provide updated procedures that tailor the level of review to the true potential environmental effects of the project, thus reducing the burden on FAA while assuring environmental protection. The procedures allow the agency to categorically exclude many projects from detailed reviews, based on agency experience with similar projects. Projects not excluded from review may require extensive documentation, with significant associated time and monetary costs. To further reduce costs and documentation processing time, FAA will:

- Continue to pursue new categories of actions for exclusion from NEPA analysis.
- Track preparation time for environmental assessments and environmental impact statements using the agency tracking database.
- Promote increased dissemination of environmental documents through the electronic media.
- Seek additional methods and opportunities for making the FAA environmental review process more efficient and to add to our best practices guidance.
- Undertake additional outreach and training of airport sponsors, consultants, and FAA personnel on NEPA guidance and environmental analysis and processing requirements.

E.O. 13423 – "Enhancing Government Performance Through Effective Environmental, Energy, and Fleet Management" – requires that executive agencies at appropriate organizational levels provide a formal structure, or Environmental Management System (EMS) for managing an organization's activities that affect the environment. The FAA has implemented EMSs for each of its major organizations. The structure of an EMS allows an organization to continually improve its environmental performance.

The Administration recognizes and encourages agencies to take advantage of the complementary activities of the EMS and NEPA environmental review processes. For example, an EMS can include extensive monitoring of actions taken by an organization that could significantly impact the environment. The NEPA review process also requires monitoring of major federal actions affecting the environment but does not provide an effective mechanism to ensure that the monitoring actually occurs. The FAA will work with the Council on Environmental Quality (CEQ) to prepare guidance that identifies opportunities for using EMS monitoring to enhance NEPA process efficiency and effectiveness. In addition, FAA will participate in CEQ's efforts to identify and demonstrate the advantages of using complementary EMS and NEPA processes to streamline the environmental review process.

Budget Request Justification

Setting Standards and Providing Oversight
(Grants-in-Aid for Airports, Office of Airports, $46.6 million, 46 FTE)

ARP strives to reduce undue delays in the planning of airport projects while maintaining the integrity of the environmental review process and complying with all environmental protection requirements. In FY 2010, FAA will continue to implement environmental streamlining provisions for capacity enhancement projects at congested airports as specified by Congress in Vision 100 legislation. Commissioning of new commercial runways, runway extensions, and airport reconfigurations is dependent on the timely completion of environmental reviews. FAA staff will also continue to work towards the streamlining of environmental reviews of critical aviation projects designated under E.O. 13274.

Performance Measure: Increase Percentage of DOT facilities Categorized as No Further Remedial Action Planned Under the Superfund Amendments and Reauthorization Act

This request for $102.4 million in ATO funding contributes to the DOT Environmental Stewardship strategic goal and to the DOT Facilities Cleanup performance measure. Key activities include remediation of contamination at sites owned by FAA, the upgrading and lifecycle management of fuel storage tanks (a significant source of contamination), and a variety of actions that support compliance with environmental and occupational safety and health regulations. The performance history and targets are displayed in Table 8. Table 9 summarizes the budget resources requested.

Table 7. Percentage of DOT facilities categorized as No Further Remedial Action Planned

DOT Facility Cleanup[1]: Percent of DOT facilities characterized as 'No Further Remedial Action Planned' under the Superfund Amendments Reauthorization Act						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Target	93%	93%	93%	93%	93%	93%
Actual	92%	92%	93%	94%	N/A	N/A

[1] Targets and results are for DOT as a whole, FAA contributes.

Table 8. Budget Request for DOT Facility Cleanup

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2008 ACTUAL	FY 2009 ENACTED (OMNIBUS)	FY 2010 REQUEST
Environmental Stewardship			
Increase Facilities Categorized as No Further Remedial Action Planned (FY 2008 & FY 2009)			
Operations	9,583	9,834	70,856
F&E	29,498	28,964	31,529
Total	**39,081**	**38,798**	**102,385**
FTE	**30**	**72**	**1,163**

* Changes for FY 2010 from FY 2009 levels are due to bookkeeping revisions in the ATO zero-based budget resulting from efforts to align business planing and budget goal allocation methods. These changes have no substantive impact on the requisite activities associated with this goal. For more information, see the Summary Budget Request Section for Environmental Stewardship on page two.

Performance Overview

The mission of FAA's Environmental Cleanup Program is to identify, characterize and remediate contamination resulting from past disposal activities and hazardous materials spills, and to comply with federal, state and local cleanup regulations. The agency has 204 contaminated locations requiring cleanup, and is responsible for 70 of the 73 DOT facilities on the Environmental Protection Agency's (EPA) Federal Hazardous Waste Compliance Docket (Docket). The FAA has worked diligently to conduct site assessment, and to take remedial and closure actions for these facilities. In January 2009, EPA Region 7 sent an email to the FAA's Central Service Area stating that the Omaha ExAF Station Z-71 (Omaha) would be assigned a No Further Remedial Action Planned (NFRAP) status in the next Docket update. With the listing of this site, FAA has attained NFRAP closure documentation for 66 of the 70 sites (94 percent) listed on the Docket. The FAA is now responsible for four sites that have not achieved NFRAP – Ronald Reagan National Airport (DCA); Kirksville Air Route Surveillance Radar (ARSR)/AFS F-64 (Kirksville AFS); Mike Monroney Aeronautical Center (MMAC); and William J. Hughes Technical Center (ACT).

To ensure that site contamination will be properly removed and that NFRAP status will be achieved, FAA's Environmental and Occupational Safety and Health Services Group provides funding and oversight support, and has initiated Environmental Cleanup Program tasks focused on these sites. It has short-term actions (1-5 years) to achieve NFRAP status for the Kirksville AFS, while longer-term actions (5-20 years) will be necessary to achieve NFRAP status for the MMAC, DCA and ACT.

Budget Request Justification

ATO Capital Programs Supporting FAA's Environmental Stewardship Performance Goals

Fuel Storage Tank Replacement and Monitoring
(Facilities and Equipment, ATO, $6.2 million)

Under current life cycle management guidelines outlined in draft order 1050.16a, the 3,005 FAA National Airspace System (NAS) tank systems, upgraded in the mid 1980s to meet regulatory changes, have reached the end of their life cycles and must be replaced. The original estimated replacement cost was $60,000 per tank, not including the replacement of any other tank system components such as piping or monitors, for 2,741 tanks. This estimate has been revised to $80,000 per tank to incorporate new regulatory requirements, changes in NAS operations, and forecasts of NAS system installations and life cycle replacement. The number of tanks was revised to include day tanks at the Air Route Traffic Control Centers (ARTCC) under the ARTCC Fuel Storage Tank Initiative Program. Additionally, funding is required to meet new State of California fuel storage tank regulations. These requirements are being incorporated into the baseline cost projections.

An additional cost component of the fuel storage tank program is continued support of the ARTCC lifecycle compliance initiative under which pipelines are being redesigned to achieve compliance with the EPA underground storage tank regulations. In addition, FAA must address its fuel storage tank liability at formerly owned sites. Approximately 90 percent of former fuel storage tanks have leaked in the past. If these sites are not cleaned up, fuel will contaminate drinking water, destroy wetlands, and damage the environment.

FY 2010 funding will be used to continue life cycle maintenance of 3,005 fuel storage tanks to support mission-critical activities, to repair emergency systems affected by unforeseen integrity losses, to meet regulatory requirement for state tank registration and licensing, and to comply with environmental requirements.

Hazardous Materials Management
(Facilities and Equipment, ATO, $20.0 million)

The FAA is responsible for cleanup of environmental contamination at sites that it has owned or operated. The agency has identified over 700 contaminated sites at 200 locations nationwide, including 73 sites (70 of which are FAA facilities) that are on the EPA Docket. Site investigations revealed that toxic contamination resulted from a variety of hazardous substances, including cleaning solvents, degreasing agents, pesticides, asbestos, polychlorinated biphenyls (PCBs), and heavy metals.

The FAA has mandatory cleanup schedules in place as part of enforcement agreements with regulatory agencies. These agreements require FAA to remediate contaminated soil and groundwater. Extensive contamination at the William J. Hughes Technical Center prompted EPA to place the site on its National Priorities List, as one of the Nation's most environmentally dangerous sites. Other contaminated sites (many of which are located in Alaska) and the requirements of the Hazardous Materials Management program account for a large portion of unfunded liabilities documented in FAA's Financial Statement.

The agency developed the Hazardous Materials Management program to manage and remediate contaminated sites. To achieve compliance with all federal, state, and local environmental cleanup statutes, including the Resource Conservation and Recovery Act of 1976 and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, FAA must continue mandated program activities. The FAA's program activities include investigating sites; managing hazardous materials and hazardous waste accumulation, handling, and disposal; installing groundwater monitoring wells; remediating site contamination; and controlling air pollution.

FY 2010 funding will allow FAA to continue to attain 93 percent "No Further Remedial Action Planned" closure documentation for FAA listed on EPA's Federal Hazardous Waste Compliance Docket by conducting contaminant investigations, implementing site remedial projects, and completing regulatory closures at the four remaining Docket sites: William J. Hughes Technical Center; Ronald Reagan Washington National Airport; Mike Monroney Aeronautical Center; and Kirksville ARSR Air Force Station. The agency will also be able to continue to perform investigations and remediation projects at all other identified contaminated sites in accordance with state mandates and enforcement agreements to limit future liability to the agency and foster environmental stewardship.

NAS Facilities OSHA and Environmental Standards Compliance
(Facilities and Equipment, ATO, $26.0 million)

Non-compliance with federal, state, and local environmental, safety and health legal and other requirements imposes significant liabilities. These liabilities include interruptions to NAS operations, violations of binding agreements, lost work time and productivity, regulatory fines and sanctions, civil and criminal lawsuits, post-incident response actions, and a decrease in employee morale. Recent examples of non-compliance events include a criminal investigation by the EPA over the improper management of asbestos containing materials at an Air Route Traffic Control Center (ARTCC) and multiple complaints of illnesses filed by FAA staff potentially exposed to molds and other air contaminants. Monthly, approximately 20 environmental, occupational safety and health (EOSH) events result in disruptions to National Airspace System (NAS) operations. Effectively managing environmental and safety risks and maintaining compliance requires the implementation of EOSH compliance programs. EOSH programs help to ensure continual identification and assessment of risks, integration of risk reduction into system designs, implementation of controls and best management practices into daily operations, and maintenance of a workforce with the knowledge to identify and mitigate EOSH risks at their source.

In FY 2010, FAA will continue the implementation of the following major Environmental, Occupational Safety and Health (EOSH) programs: the Fire Life Safety Program, the Occupational Safety and Health (OSH) Compliance Program, the Environmental Compliance Program, the Incidence Response Program, the Requirements Integration Program, the Safety Integration Program; the EOSH Training Program, and the Inspection Program.

Environmental and Occupational Safety and Health Services
(Operations, ATO, $66.5 million, 1,082 FTE)

The continued viability and effectiveness of the ATO Capital programs described above requires a high level of expertise maintained across a broad spectrum of complex environmental, health, and safety disciplines and associated regulations. ATO Salaries and Expense funds are required to contract with subject matter experts, provide ongoing technical training for FAA employees, and provide required equipment and materials, such as personal protective equipment necessary for the safety of employees.

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SECURITY, PREPAREDNESS & RESPONSE

Introduction

While primary responsibility for transportation security is under the purview of the Transportation Security Administration (TSA)—an agency within the Department of Homeland Security—FAA continues to make important contributions to the security of the National Airspace System (NAS). The agency also provides financial and other assistance to help airports meet security requirements and ensures the security of FAA personnel, facilities, equipment, and data. The agency works closely with TSA and other federal agencies to support a safe and secure NAS.

Organization

The FAA's *Flight Plan* does not include an explicit Security goal, but in FY 2009, a new Continuity of Operations performance measure was added to measure FAA's ability to respond to crises, including security-related threats and natural disasters. For purposes of this performance budget, FAA resources that support this measure, as well as FAA's cyber security events measure and the DOT-level security objectives, are presented.

Narrative sections contain parenthetical inserts that summarize resource requests. For Operations and Grants-in-Aid for Airports (AIP), the inserts show the total resources for that appropriation that support the Security goal. For Facilities and Equipment, the inserts show resources for selected individual programs. Unlike Safety, the resources associated with individual Security goals are not discrete, and attempting to divide dollars among the goals would be somewhat arbitrary.

For complete disclosure of IT funding directly supporting DOT objectives, please refer to the technology investments justifications in Section 3 both in the Office of Information Services/Chief Information Officer detailed justification and in the ATO Capital Program section.

Table 1 summarizes the Security budget request. Table 2 provides the discretionary increase budget request by allocation

Summary Budget Request

Table 1. Total Security Budget Request

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2008 ACTUAL	FY 2009 ENACTED (OMNIBUS)	FY 2010 REQUEST
Security, Preparedness, and Response			
Operations	84,222	100,208	108,359
F & E	44,659	44,468	49,960
AIP	72,522	91,847	91,906
Total	**201,403**	**236,523**	**250,225**
FTE	**454**	**472**	**509**

Table 2. Discretionary Increase Request

	($000)	FTE
OPERATIONS		
Security and Hazardous Materials		
National Security System and Classified/Control Unclassified Information Program	1,300	9.0
National Security Coordination Division/Counterintelligence	713	5.0
Security and Hazardous Materials Total	*2,013*	*14.0*
Office of Information Services		
FAA Privacy Program	2,557	7.0
Information Systems Total	*2,557*	*7.0*
OPERATIONS TOTAL	***4,570***	***21.0***

Performance Overview

While FAA does not contribute directly to DOT's Security performance goal, the agency is responsible for the safe transportation of hazardous materials in air commerce. The FAA develops and implements national policy on hazardous materials through inspections, training, and outreach to those involved in the production and air transport of hazardous materials worldwide. The agency also safeguards airline passengers through investigations of violations of both hazardous material regulations and alcohol and drug-related charges against airmen. Additional efforts concentrate on securing FAA personnel and infrastructure as discussed in the following paragraphs.

Budget Request Justification

While NAS security is critical to the security of the flying public during all stages of flight, most of FAA's security-related resources focus on enhancing the security of its personnel, facilities, and assets.

Securing FAA Facilities, Personnel, Communications, and Investigations
(Operations, Security and Hazardous Materials, $64.6 million, 342 FTE)

Security and Hazardous Materials (ASH) is responsible for ensuring that FAA employees and facilities are protected from terrorist and other criminal acts, classified and sensitive unclassified information are protected, and communications secure. One hundred percent of the following programs' requirements will be accomplished with requested workforce and funding levels.

Facilities

ASH manages FAA's Facility Security Management Program (FSMP), which ensures compliance with both Homeland Security Presidential Directive 7 (HSPD-7) and Executive Order (EO) 12958, as amended by EO 13292. This directive, dated December 17, 2003, requires all federal agencies to protect and ensure the confidentiality, integrity and availability of all critical infrastructures. The FSMP ensures the adequate protection of FAA personnel and facilities and protects operations against terrorism, vandalism, sabotage, fraud, waste, and abuse.

Communications

ASH leads the agency in protecting classified and sensitive unclassified information and securing communications. The Communications Security Program (COMSEC) provides procedures to safeguard U.S. classified cryptographic material and equipment. COMSEC supports FAA mission of maintaining a secure information environment for the many sensitive undertakings within the NAS, including the work of the Departments of Defense, State, Justice, and the National Security Agency.

ASH's National Security and Intelligence Coordination Division provides support to sensitive and classified counter-terrorism, narcotics smuggling interdiction, law enforcement, or other national and homeland security activities involving FAA assets as required at the national level. This support involves, but is not limited to, the coordination of inter-agency, inter-departmental, and intra-departmental activities in support of aviation security, transportation security, and various national and homeland security matters.

Emergency Operations and Communications ensure crisis management support, providing FAA officials with timely, critical information to plan, direct, and control all aspects of FAA essential operations. This program manages and maintains FAA Headquarters' Continuity of Operations (COOP) facilities to provide alternate locations from which FAA essential functions and command and control may be assured.

Additionally, Emergency Operations and Communications directs and guides the development of the FAA-wide plan to sustain essential government services during a pandemic outbreak. This organization represents FAA through participation in Congressionally-mandated national level exercises that include accurate simulations of airspace control issues and promote the practice of safe and authorized procedures within the NAS. It also provides a Washington Operations Center Complex from which to monitor world events, collect information, make notifications, coordinate response, provide communications and support services, and act as an interagency focal point.

The Classified and Sensitive Security Information Protection Program develops standards and programmatic controls and provides agency requirements on the creation, storage, accountability, dissemination, and destruction of classified and sensitive information. This directly supports FAA's mission of protecting the security of FAA personnel and assets as well as the safety of the traveling public.

The Technical Surveillance Countermeasures Program (TSCM) supports the Classified and Sensitive Security Information Protection Program, protecting telephone systems, equipment, conference rooms, and office areas that are used for classified and sensitive information processing.

Investigations

The Law Enforcement Assistance Program supports federal, state, and local agencies by denying NAS access to any person(s) who would threaten national and homeland security by committing criminal acts. Law Enforcement Assistance provides aviation-related support to law enforcement agencies seeking criminal prosecution or conducting airborne drug interdiction. This program also involves conducting ramp inspections of aircraft at airports to look for identifying characteristics that may indicate the aircraft is used to commit criminal acts.

The FAA conducts two types of investigations for alleged violations of regulations—administrative and regulatory. Administrative investigations examine possible breaches of conduct that could impact the hiring, employment, and/or clearances of FAA employees and contractors. Included in this category are investigations of DOT/FAA Hotline complaints. Regulatory investigations of airmen are conducted for violations of federal aviation regulations. These typically involve alcohol or drug-related charges against airmen for driving under the influence or driving while intoxicated—charges which must be reported to FAA.

The FAA ensures that employment, or continued employment, of FAA personnel will promote the efficiency of services provided and safeguard national security. This program ensures that all employees, applicants and contractors have the appropriate background investigation as required by Executive, DOT and FAA Orders, receive fair and equitable treatment, and are granted national security clearances when needed. This program also serves as a framework for the adjudicative authority for all agency security clearance denials and revocations.

ID Media Program

In compliance with Homeland Security Presidential Directive - 12 (HSPD-12), "Policy for a Common Identification Standard for Federal Employees and Contractors", ASH established the ID Media Program for enrollment and issuance of the new Personal Identification Verification (PIV) cards to approximately 80,000 federal and contract workers in the FAA.

The ID Media Program provides for positive and verifiable access control into FAA facilities and critical areas. FAA establishes the processes used to issue, protect, and control identification media for employees and contractors at staffed facilities nation-wide. Identification media is used as the principal tool for granting entry into FAA facilities and will ultimately provide access to computer systems. The ID Media Program directly supports the NAS and the FAA mission by establishing positive control over who is allowed into defined areas, thereby limiting unauthorized or uncontrolled access to mission critical systems and providing a secure and safe environment for personnel administering and using the NAS.

FAA has designed and implemented an Identity Management System (IDMS) to support the FIPS 201 requirements for identity proofing, applicant enrollment, background investigation, adjudication, and card issuance. This system is the core upon which Personal Identity Verification (PIV) card authorization and issuance is based for employees and contractors nation-wide.

The ID cards have both elements of appearance which are standardized government-wide and other characteristics which are unique to the Department of Transportation. The cards contain a computer chip which makes possible the rapid verification of the card holder's identity, automated access to physical facilities and computer systems. They also make possible improvements in personal privacy, physical and computer security and access to data systems.

Deployment of the new PIV cards and IDMS system began with Phase I (FAA headquarters) and Phase II (Regional Offices) in FY 2008. Deployment in Phase III to larger air traffic and other FAA operational facilities will begin in late FY 2009 and continue through FY 2010.

Discretionary Increase Request: National Security System and Classified/Control Unclassified Information Program (NSS/C/CUI)
($1.3 million, 9.0 FTE)

The National Security Systems and Classified/Controlled Unclassified Information Program deals with the protection of all types of information, regardless of form or media. Information requiring protection includes, but is not limited to, For Official Use Only (FOUO) information, Sensitive Security Information (SSI), Privacy Information, Personally Identifiable Information (PII), procurement sensitive information, and classified national security information.

FAA's current information protection model was structured to protect and control information in paper form. However, data for the past five years shows a continuing annual decrease in receipt of paper documents with nearly all information being received electronically or on electronic media. Ensuring the protection and control of electronic information at the same level of protection we afford our paper based information requires a cultural and business process change in the program.

The discretionary increase of $1.3 million will enable the FAA to implement the necessary security measures and oversight needed for the electronic protection of NSS/C/CUI. This includes the required certification and accreditation of NSS; establishment of a process and repository to track disclosures of C/CUI in connection with international agreements, foreign visits and exchanges, domestic technology transfer/information sharing agreements; implementation of a mission and information technology oriented NSS/C/CUI inspection program; migration from COMSEC paper keying to an electronic key management infrastructure; and the revision of program related security training, awareness and outreach programs to address the NSS/C/CUI protection in the electronic environment.

Discretionary Increase Request: National Security Coordination Division/Counterintelligence
($713,000, 5.0 FTE)

The Counterintelligence Section of the National Security and Intelligence Coordination Division will directly enhance the safety and security of the NAS and other FAA equities by protecting FAA personnel and technologies from exploitation by hostile intelligence services. This will be accomplished by using information obtained from multiple sources. The inherent vulnerabilities in our evolving aerospace technologies present challenges to safeguarding the integrity of data, and makes the FAA as well as its aviation and space partners open to loss or outright theft of sensitive and/or proprietary information. This directly impacts the FAA's ability to meet mission objectives and protect its resources from hostile entities determined to embarrass or undermine U.S. leadership in aviation.

ATO Capital Programs Related to Security

Facility Security Risk Management (FSRM)
(Facilities and Equipment, ATO, $18.0 million)

This program contributes to the security goal by reducing the risk of intrusion or unauthorized entry into FAA facilities as required by HSPD-7. The FAA has developed a prioritized listing of FAA-staffed facilities to determine security risk management modifications, procedures, and measures. ASH conducts routine facility inspections to ensure compliance with published security directives. FY 2010 funding will be used to support the following upgrades: Phase I Site Survey/Engineering Design at one Large TRACON; Phase 2 construction/equipment installation at one Large TRACON; security upgrades at 20 Security Level 1 and Security Level 2 facilities; and perimeter hardening at 22 ARTCC's.

Securing Airport Infrastructure

(Grants-in-Aid for Airports, Office of Airports, $91.9 million, 2 FTE)

The grants issued under Grants-in-Aid for Airports (AIP) provide funding to airports for equipment and facilities used to control access to their critical operations areas. In order to receive funding, projects must be identified in TSA-approved airport security plans covered by Airport Security regulations as well as airports with security needs not covered by the regulation.

In FY 2010, ARP anticipates awarding over $53 million in security-related AIP grants. Security projects required by statute or regulation carry the highest priority for AIP funding. Projects providing for the security of passengers and other persons in the terminal, as well as the terminal buildings themselves, are treated equally with projects to secure aircraft and the aircraft operations area. The most common type of security project supported by AIP funding is the installation of access control equipment. The ARP staff manages and executes the AIP grant program, providing guidance on AIP eligibility. The ARP staff also formulates the Airports' Capital Improvement Program that identifies security needs and works closely with the respective airport owners and the TSA (local federal security directors) to identify and fund eligible security requirements and/or needs.

Emergency Airspace Operations

NAS Recovery Communications

(Facilities and Equipment, Security and Hazardous Materials, $10.2 million)

The NAS Recovery Communications (RCOM) program provides FAA with command and control communications (C3) capability to directly manage and operate the NAS during local, regional and national emergencies, when normal common-carrier communications are interrupted. The NAS C3 provides and enhances a variety of fixed-position, portable, and transportable C3 systems to support emergency operations. Such C3 systems include the automatic digital network/defense messaging system; secure telephone unit third generation/secure telephone equipment; secure facsimile; very high frequency (VHF)/Frequency Modulated (FM); high-frequency single-side band; satellite telephone network; wireless notification system; secure conferencing system; Emergency Operations Network (EON); classified Automated Detection and Process Terminal (ADAPT); and communications in emergency situations. These C3 systems enable FAA and other federal agencies to exchange classified and unclassified communications to promote national security. The RCOM program also supports the Washington Operations Center Complex and modernizes several FAA "continuity of operations" sites, which ensures FAA executives have command and communications during times of crisis.

The RCOM program contributes to the FAA's security goal by ensuring FAA's C3 structure can provide classified and unclassified, time-critical, public and NAS information for the FAA Administrator during emergencies. The FAA Administrator shares this information with staff members, key regional managers, the Secretary of Transportation, and other national-level executive personnel.

Information Security

(Operations, Office of Information Systems Security/Chief Information Officer, $37.3 million, 85 FTE)

The Office of Information Services/Chief Information Officer (AIO) is responsible for ensuring FAA's critical information systems, networks, and administrative systems are protected from cyber-terrorism and malicious activities by hackers and other unauthorized personnel as required by HSPD-7, the Computer Security Act of 1987, the Federal Information Security Management Act (FISMA) of 2002, and the OMB Circular A-130. For FAA, this means ensuring the protection of NAS Information Systems as well as other federal information systems. FISMA requires the Inspector General (IG) to perform annual assessments of the agency's Information System Security program and to provide recommendations for improvement. The FAA's response to the GAO audit and implementation of the annual recommendations is ongoing. Each year the Congress provides a letter grade assessment of the cyber-security program.

This effort contributes to the DOT and FAA Security goal by implementing a cyber-security program to adequately protect DOT systems integrated with the national critical infrastructure and by employing advancements in secure, certified, and accredited information technology and communications to improve the exchange of information. The following table outlines the activities supported by funding in this area.

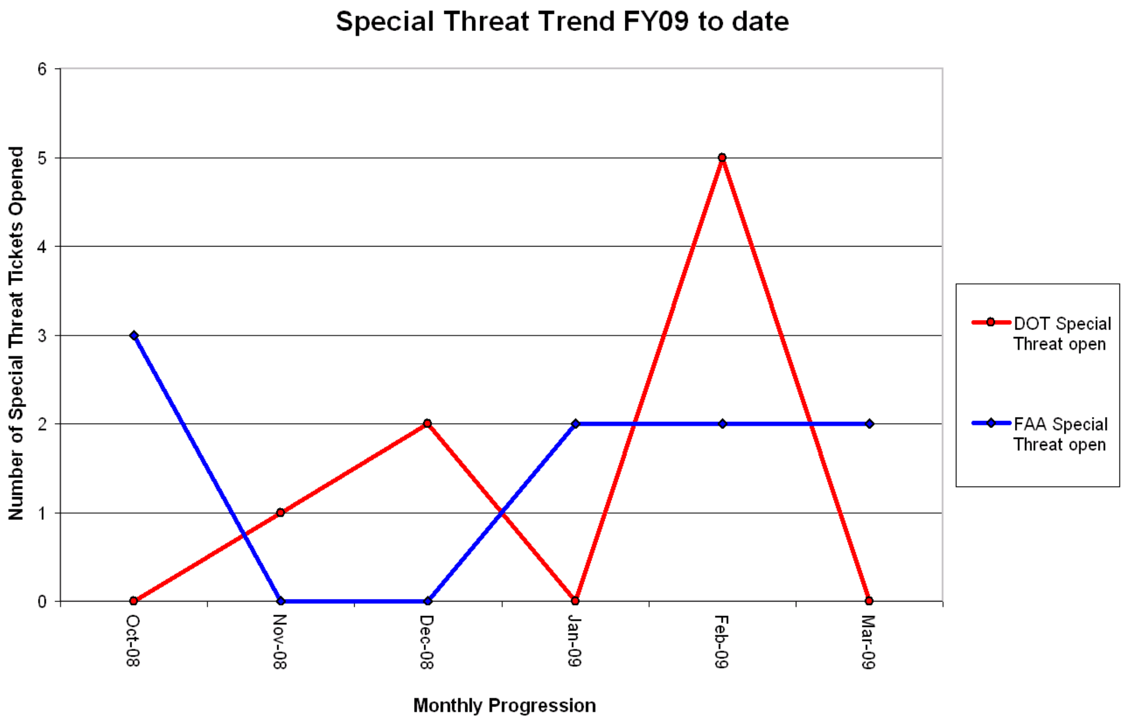
INFORMATION SECURITY ACTIVITIES (Operations, Office of Information Systems Security/Chief Information Officer, $37.3 million)
➔ Enhancement of the NAS architecture to include cyber-security. ➔ Develop processes that would allow for faster decision loops to support near-real-time planning. ➔ Harden individual systems and network elements by completing remediation for the discovered vulnerabilities in each of the NAS and administrative systems. ➔ Continue to enhance boundary protection to NAS facilities while beginning protective methodologies down to the desktop. ➔ Improve recovery rate during times of cyber-attacks through information sharing from the Cyber Security Management Center (CSMC). ➔ Conduct systemic monitoring at the CSMC. ➔ Address the challenge of providing cyber-protection while maintaining reliability, availability and integrity through applied research and development initiatives. ➔ Provide security training and raise the security proficiency of FAA's information technology workforce.

The Cyber Security Management Center (CSMC), the successor to the CSIRC, monitors the NAS and administrative systems to detect intrusions. In FY 2010, CSMC will continue to increase its monitoring of local area networks and desktops. In the event of an intrusion, CSMC works with the impacted organization to assess damage and restore the system. Funding is needed to add licenses, refresh software, update equipment, and provide subject matter experts to the center to keep pace with cyber terrorists and hackers who are employing increasingly sophisticated means to compromise government information systems.

In addition, DOT has joined with FAA to protect the cyber assets of the Department. DOT and FAA merged operations and management of the DOT Transportation Cyber Incident Response Center and FAA CSIRC into the Cyber Security Management Center to protect information technology assets. This requires funding for contract support, hardware and software. A disaster recovery site for the CSMC operation has been established which requires funding for leases, utilities, hardware and software.

A new requirement which supports FAA Telecommunications Infrastructure (FTI) is the monitoring and analysis of 72 Harris sensors. This new task includes incident handling responsibility, remediation coordination, second-level analysis, signature creation, sensor tuning and ArcSight configuration. Also, CSMC will monitor new sensor systems for En Route Automation Modernization, Common Automated Radar Terminal System, and NAIMES and an additional 620 sensors for wireless. Also, sensor monitoring for ATO, ARC, ARP and all en route centers has increased by 600 percent. There is an increase in SPECIAL THREAT activity affecting administration and operations networks, and ATO date exfiltration.

This program directly supports the FYs 2009-2013 FAA *Flight Plan* Organizational Excellence Goal: "*Achieve zero cyber security events that disable or significantly degrade FAA services*." Without sufficient funding in this area, FAA is in danger of not meeting this goal. Special Threat events are targeted attacks on federal government systems which pose a serious and imminent threat to those systems. These are events specific in nature, objective and patterned, and by design are hostile in intent. To date, FAA has had nine such attacks. Understanding all aspects of these events dictates that they be detected and prevented to the maximum extent to which the target (in this case FAA or other agencies) is capable. Special Threat responses were initiated to allow better communication of such events and identification and mitigation of systems that have been compromised or affected by these sophisticated attacks. The chart which follows shows the monthly Special Threat event trend for October 2008 through March 2009.



The requested funding will also enable the agency to reduce identity fraud, protect personnel privacy, and improve operational efficiency. Broadly speaking, this funding serves to increase the reliability, availability, and integrity of the NAS, provide mission support and administrative information, and address all other FAA information systems requirements.

Discretionary Increase Request: Information Security & Privacy
(Operations, Office of Information Systems Security/Chief Information Officer, $2.6 million, 7 FTE)

The Office of Information Services/Chief Information Officer (AIO) is responsible for ensuring FAA's critical information systems, networks, and administrative systems are protected from cyber-terrorism and malicious activities by hackers and other unauthorized personnel as required by HSPD-7, the Computer Security Act of 1987, the Federal Information Security Management Act (FISMA) of 2002, and the OMB Circular A-130 and the Privacy Act. For FAA, this means ensuring the protection of NAS Information Systems as well as other federal information systems.

Internal audits have revealed that FAA is not exercising the controls needed to securely manage and protect our PII data. Without this additional funding the agency will continue to be susceptible to malicious attack and will experience increasing numbers of privacy incidents with deleterious effects. In February 2009, the FAA experienced the largest Privacy breach in DOT exposing personally identifiable data (PII) from 2006 on over 45,000 employees. As a result the agency had to notify its employees, many of whom had left the agency, and provide credit monitoring protection. This cost the agency millions of dollars and damaged its credibility as a trusted repository of personal data.

With the requested funding and staffing the agency will have the ability to terminate malicious activity in near real time and reduce significant loss of data. The FAA also expects to achieve a reduction in – privacy incidents to pre-2007 levels; unauthorized collection, storage, and transmission of PII data; and the use of social security numbers as passwords or in data files unless approved. This request directly supports the FYs 2009-2013 FAA *Flight Plan* Organizational Excellence strategic initiative to "protect FAA-sensitive and individual privacy information from unauthorized disclosure."

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ORGANIZATIONAL EXCELLENCE

As the aviation community continues to face a tough economic environment, FAA faces many difficult management challenges. FAA's central management strategy for achieving organizational excellence is to deliver the results described in the *Flight Plan* and to refine our focus on the strategic management of agency human capital. The *Flight Plan* is the means for the agency to improve performance and measure success.

More efficient and effective management of resources is the major aim of FAA's efforts to achieve Organizational Excellence. Working with employees and industry partners, FAA strives to invest in high-performing programs and services. At the same time, it must end those that are redundant or ineffective. Likewise, the agency must minimize costs and use resources wisely while maintaining its focus on customer requirements and aligning its products and services to their needs.

In addition, the agency is committed to attracting, training, motivating, and retaining highly qualified employees. In its pursuit of Organizational Excellence, FAA promotes the development of leaders who know how to build and sustain a performance-based organization, and enhance fiscal accountability to ensure that the right resources go to the right programs, allowing the agency to achieve all of its goals. With the establishment of the Air Traffic Organization (ATO) in FY 2004, the *Flight Plan* and its emphasis on performance results found a new focus. This management tool, plus the enormous effort the agency expends in strengthening the ATO, will allow it to achieve its business and human resource goals in FY 2010 and beyond. This is especially important for ATO as it continues to solidify its organization while also planning for an impending retirement bubble. Over the next 10 years, approximately 55 percent of the agency's nearly 15,400 controllers will become eligible to retire. Total losses over the next 10 years, including retirements, are expected to be over 14,000. The ATO is diligently working to phase in replacement hires for the highly skilled workforce that is retiring and expedite quality training of new hires . More details can be found in the 10-Year Strategy for the Air Traffic Control Workforce first submitted to Congress in December 2004. Updates to the plan were issued in 2006, 2007, and 2008. An interim update to the report was submitted to Congress in March 2009. The formal update will be submitted with the FY 2010 Congressional budget.

Section Organization

This budget request is organized into two primary groupings: (a) agency programs and initiatives by DOT's Organizational Excellence initiatives and the FAA *Flight Plan* performance objectives and (b) groups of agency programs and initiatives by organization-specific funding dollars/FTEs and requisite budget justifications. The Organizational Excellence funding directly supports DOT's Major Acquisition measures, which are also included in the *Flight Plan*, as well as DOT's performance measures for Major Federally Funded Infrastructure projects. The narrative summaries for Operations and Grants-in-Aid for Airports (AIP) programs present the total amounts for each involved organization.

Table 1 summarizes the Organizational Excellence budget request. Table 2 provides the discretionary increase budget request by allocation. Exhibits IV-1 in at the beginning of this section and II-3 in Section 2 provide additional details.

Summary Budget Request

The FAA requests approximately $1.5 billion to implement its Organization Excellence goals and to ensure the success of the its mission through stronger leadership, a better-trained and safer workforce, enhanced cost-control measures, and improved decision-making based on reliable data. Table 1 summarizes the Organizational Excellence budget request. Table 2 provides the discretionary increase budget request by allocation.

During the formulation of this request, ATO undertook a review of its method for allocating resources to DOT goals, comparing previous budget submissions with its Business Plans. In order to better align its zero-based budget with its plans, the organization has made bookkeeping revisions to its goal allocations for FY 2010. These include shifts to Organizational Excellence from other goal areas by various organizations in support of air traffic controller and administrative training, IT upgrades, process and procedure updates, and service center level administering of day-to-day business. These shifts do not reflect actual changes from FY 2009 in ATO programs or priorities. They have no substantive impact on any activities associated with the goals.

Table 1. Total Organizational Excellence Budget Request

Federal Aviation Administration
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

STRATEGIC GOALS & PERFORMANCE MEASURES BY APPROPRIATION	FY 2008 ACTUAL	FY 2009 ENACTED (OMNIBUS)	FY 2010 REQUEST
Organizational Excellence (FY 2008 only)			
Operations	155,488		
F & E	273,286		
AIP	9,903		
Total	**438,677**		
FTE	**1,095**		
Organizational Excellence (FY 2009 & FY 2010)			
FAA Activities Supporting DOT's Organizational Excellence Initiatives			
Operations		156,418	1,174,013
F & E		251,475	253,808
AIP		8,321	9,362
Total		**416,214**	**1,437,182** *
FTE		**991**	**4,780**
Percentage of Major Federally Funded Transportation Infrastructure Projects with less than 2 percent Annual Growth in the Project Completion Milestone as Reported in the Finance Plan			
AIP		2,000	2,092
Total		**2,000**	**2,092**
FTE		**4**	**4**
Percentage of Financial Plan Cost Estimates for Major Federally Funded Transportation Infrastructure Projects with Less than 2 percent Annual Growth			
AIP		2,000	2,092
Total		**2,000**	**2,092**
FTE		**4**	**4**
For Major DOT Systems, the Percentage of Scheduled Milestones Established in the Acquisition Project Baselines that are Met			
F&E		32,390	23,587
Total		**32,390**	**23,587**
FTE		**32**	**23**
For Major DOT Systems, the Percentage of Cost Goals Established in the Acquisition Project Baselines that are Met			
F&E		32,390	23,587
Total		**32,390**	**23,587**
FTE		**32**	**23**
Organizational Excellence $ Total	**438,677**	**484,993**	**1,488,540**
Organizational Excellence FTE Total	**1,095**	**1,063**	**4,834**

* Changes for FY 2010 from FY 2009 levels are due to bookkeeping revisions in the ATO zero-based budget resulting from efforts to align business planing and budget goal allocation methods. These changes have no substantive impact on the requisite activities associated with this goal. For more information, see the Summary Budget Request Section above.

Table 2. Discretionary Increase Requests

	($000)	FTE
OPERATIONS		
Human Resource Management		
Automatic Staffing and Application Process (ASAP)	500	0.0
OPERATIONS TOTAL	***500***	***0.0***
GRANTS-IN-AID FOR AIRPORTS		
AIP and PFC Information Technology Staff	80	0.5
CATS Modernization	100	0.0
Document Scanning Development	478	0.0
GRANTS-IN-AID FOR AIRPORTS TOTAL	***658***	***0.5***
TOTAL	***1,158***	***0.5***

FAA uses the *Flight Plan* to improve performance and measure success. The funding required to support FAA's management reform initiatives allows the agency to strengthen its internal systems, paving the way for the achievement of other strategic goals set forth in the *Flight Plan*. The agency's contributions to DOT's major acquisitions and federally-funded infrastructure programs performance measures improve the management of the Department's capital investments. These contributions result from FAA's major air traffic control systems and airport infrastructure projects that are on schedule and within estimated costs. Each of the Organizational Excellence performance measures is briefly described below.

Performance Measure: For Major DOT Acquisitions, Percentage of Scheduled Milestones Established in Acquisition Project Baselines that are Met

The following two acquisition measures are included in both the DOT Strategic Plan and the FAA *Flight Plan*.

Table 3. Percentage of FAA's major system acquisitions on schedule

	2005	2006	2007	2008	2009	2010
Target:	80.00%	85.00%	87.50%	90.00%	90.00%	90.00%
Actual:	92.00%	97.44%	97.00%	93.88%	N/A	N/A

Performance Measure: For Major DOT Acquisitions, Percentage of Cost Goals Established in Acquisition Project Baselines that are Met

Table 4. Percentage of FAA's major system acquisitions within established cost baselines

	2005	2006	2007	2008	2009	2010
Target:	80.00%	85.00%	87.50%	90.00%	90.00%	90.00%
Actual:	97.00%	100%	100%	96.08%	N/A	N/A

FAA continues to improve its acquisition program implementation to ensure that by FY 2008, 90 percent of critical programs are on schedule and within 10 percent of budget.

Performance Measure: Major Federally-Funded Transportation Infrastructure Projects with Less than 2 Percent Annual Growth in the Project Completion Milestone

Table 5. Percentage of major transportation infrastructure projects with less than 2 percent annual growth in the project completion milestone as reported in the finance plan

	2005	2006	2007	2008	2009	2010
Target:	N/A	90.0%	90.0%	90.0%	90.0%	90.0%
Actual:	89.0%	89.0%	89.0%	79.0%	N/A	N/A

Performance Measure: Finance Plan Cost Estimates For Major Federally-Funded Transportation Infrastructure Projects with Less Than 2 Percent Annual Growth

Table 6. Percentage of finance plan cost estimates for major federally-funded transportation Infrastructure projects with less than 2 percent annual growth

	2005	2006	2007	2008	2009	2010
Target:	N/A	90.0%	90.0%	90.0%	90.0%	90.0%
Actual:	81.0%	84.0%	83.0%	82.0%	N/A	N/A

FAA contributes to DOT's transportation infrastructure goals along with other modal administrations. These targets promote better management of the agency's mega-projects, chiefly the construction of new air traffic system components and airport projects such as terminals and runways. On large airport infrastructure projects, like a new commercial service runway, the amount of federal funding is approximately 20 percent of the total cost with the balance of funding being derived from local sources. This permits federal funding to remain within the targeted budget amount.

Performance Overview

Human Capital

Acquiring a Highly Skilled Workforce - To support the effective management of human capital and to ensure FAA has the appropriate human resources to meet mission requirements, the *Flight Plan* identifies FAA's strategic human capital goals which tie directly to the management of human capital through the DOT's Organizational Excellence goal. The human capital initiatives support FAA's *Flight Plan* by building a skilled and knowledgeable workforce that is capable of promoting a safe and efficient National Airspace System (NAS) and providing world class aviation services to the flying public. FAA is also committed to making human capital decisions that are robust, data-driven and results-oriented.

Leadership Development – The anticipated retirement of FAA managers and executives provides a unique opportunity to reshape the agency's leadership team. FAA's Human Capital Plan projects that 32 percent of our current executives, 29 percent of senior managers, and 27 percent of frontline and middle managers will retire over the next four year period. Taking a strategic approach to the selection and development of their replacements will build a leadership cadre with the competencies needed to meet the safety and capacity challenges ahead. In FY 2010 FAA will extend systematic leadership succession planning and development from its executive and senior management population to encompass all leadership levels. FAA plans to implement formal development programs for prospective executives and aspiring frontline managers and to revamp and build out the agency's management and executive training curriculum at FAA's Center for Management Executive Leadership (CMEL).

In 2007, twenty-eight participants were selected for the Senior Leadership Development Program (SLDP), FAA's first executive development program in over 10 years. SLDP includes a formal assessment center, leadership coaches, executive advisors, individual learning plans, and core training provided by the Federal

Executive Institute, Brookings Institution, and the Harvard Business School. A second SLDP cohort is planned for FY 2010. AHR launched the new Program for Emerging Leaders (PEL) in FY 2009. PEL is targeted to full non-supervisory employees who aspire to be in management and will provide opportunities over an 18-month period for assessment, mentoring, training, and developmental assignments. Follow-on cohorts are planned in FY 2010.

FAA conducts annual assessments of leadership skill gaps within its management population to measure progress in closing key competency gaps and to determine new or ongoing training requirements. In FY 2010 the agency plans to implement substantial curriculum revisions to update core frontline management training as well as advanced courses in change management, strategic planning, and executive decision-making for senior managers. We will also enhance our pre-and post-training outreach to enhance the value of training back on the job.

FAA has implemented comprehensive policies on the selection, training, and certification of probationary managers. A special curriculum is assigned to new probationary managers shortly after their appointment. Certification of proficiency by their 1st and 2nd level managers is required at the end of the 12 month probationary period. New processes are being developed and will be implemented in FY 2010 to ensure timely completion of training and promote accountability.

Air Traffic Controller Retirement Bubble - FAA is preparing for the growing number of air traffic controller retirements projected through FY 2018. The agency is 5 years into the beginning of the retirement bubble. Since controllers don't retire immediately upon becoming eligible, the ATO is phasing in the replacement hires. The replacement hiring wave for retirements, as well as other attrition, will continue with more than 1,000 new hire controllers per year through 2018. Through strategic workforce planning, the agency issued its *A Plan for the Future: The FAA's 10-Year Strategy for the Air Traffic Control Workforce* in December 2004 that sets a course of action to ensure a sufficient number of qualified controllers to meet capacity and air traffic needs of the future. The plan has been updated every year since. An interim update to the report was submitted to Congress in March 2009. The formal update will be submitted with the FY 2010 Congressional budget.

Linking Employee Compensation to Performance - The FAA's Organizational Success Increase (OSI) and Short Term Incentive (STI) programs help to strategically manage FAA's workforce by linking pay to performance. Each fiscal year, FAA's Management Board establishes FAA strategic goals, initiatives, and performance targets in the four Goal Areas (Safety, Capacity, International Leadership, and Organizational Excellence). OSI goals are directly linked to the FAA *Flight Plan*. The accomplishment of these agency-wide goals serves as the basis for granting an OSI as an annual adjustment to the base salaries of eligible FAA employees. The STI program is intended to help communicate corporate goals and the Administrator's priorities for the year, while providing incentives to the executive leadership for helping lead the accomplishment of these goals and priorities.

Personnel reform for the agency, granted in 1998, with conversion from the traditional GS-Schedule pay system to pay-for-performance, continues to bear fruit. This conversion allows the agency to flatten pay bands and tie performance to pay increases. Accountability for results is systemic throughout FAA, with 84 percent of our employees on the pay-for-performance system, including our executives. *Flight Plan* performance targets must be achieved before annual pay raises are granted. Executives and managers have a good deal of discretion in rewarding high-performing employees, and incentives are present to ensure quality work and innovation are suitably rewarded. Executives are also eligible for annual STI payouts when specific performance thresholds are met or exceeded.

Labor Management Relations - In the FY 2009-2013 *Flight Plan*, FAA continued its strategy to improve labor management relations while delivering quality customer service. The performance target is to "Reduce grievance processing time by 30 percent (to an average of 102 days) by FY 2010 over the FY2006 baseline of 146 days and maintain the reduction through 2013." The agency's goal is to manage and appropriately address employee concerns and grievances while promoting stronger labor management relations and a cooperative, collaborative work environment. Performance against this goal directly impacts FAA's ability to deliver consistent, high-quality airspace services for its customers.

Financial Management

FAA continues to implement two strategies contained in the FY 2009-2013 *Flight Plan* to address the need for cost reduction and improved financial management. These include a centrally managed cost control program led by the Office of Financial Services, better financial and procurement oversight, and improvements in the tools and training necessary for financial management.

Cost Control - As part of the cost reduction program, FAA will implement agency-wide cost reduction initiatives as well as individual cost reduction efforts within each organization. These cost reduction efforts include the Strategic Sourcing for the Acquisition of Various Equipment and Supplies (SAVES) initiative, which is an ambitious effort to implement best practices from the private sector in the procurement of administrative supplies, equipment, and IT hardware. To-date, the SAVES program has achieved over $35 million in cost savings.

Improved Financial Performance - Ongoing improvements in financial performance will focus on providing more timely and accurate financial information to assist management in their decision making, thereby driving improved results in FAA operations. Planned business process improvements will focus on routine capitalization of projects, a major overhaul of financial policy and procedures, enhancements to corporate financial and acquisition systems, streamlined processes for managing agency reimbursable agreements, and training – all of which continue to improve timeliness and accuracy of financial information.

Financial Oversight of Agency Procurements - The Administrator issued guidance in August 2005 that required better oversight of acquisitions. The Chief Financial Officer (CFO) is exercising greater oversight and fiscal control over all agency procurements, including support services contracts. Written authorization from the CFO is required before FAA issues any procurement request for products and services costing $10 million or more.

Within the CFO's organization, the Office of Financial Controls implemented a contract review process for all contracts with a value of $10 million or more effective October 1, 2005. CFO approval is based on a review of the business case justification, cost estimates, and statement of work to be performed. Since the new approval process was implemented, the CFO evaluated over 165 proposed acquisitions with an estimated contract value of over $9 billion.

Competitive Sourcing - In FY 2005, FAA completed the public/private Competitive Outsourcing study of the Automated Flight Service Stations (AFSS), the largest and most complex A-76 competitive sourcing acquisition undertaken in government. As a result, FAA will save $2.1 billion during the 13-year period 2003-2015.

Performance Improvement - The main objective of DOT's performance improvement effort is to build FAA's budget in a way that concretely demonstrates what the agency is doing with its allocated funding. The goal is to show how increases or decreases in the agency's budget affect its performance metrics and how activities across the six goal areas work together.

DOT's goals stress the implementation and use of performance measures to track program viability. In particular, the implementation of efficiency measures has been noted as one of six criteria to reach "green" status.

The performance improvement initiative encourages agencies to develop efficiency in executing programs, implementing activities, and achieving results while avoiding wasted resources, effort, time and money. The FAA has taken significant steps to integrate performance information into budgetary decision making to ensure resources are properly aligned with FAA's mission and goal activities. In FY 2007, to support a new Flight Plan initiative, all FAA organizations' Business Plans developed efficiency measures. Targets were set for these measures in FY 2008. These targets were established to provide a compass for future decision-making. Through 2009 FAA has tracked these measures and has also developed additional ones. An example of efficiency measures developed for this program include:

- Cost per Controlled Flight (ATO)
- Cost of Certification of Part 145 Repair Station (AVS)
- Airport Improvement Program (AIP) Cost per Grants (ARP)
- Airport Compliance with American Disabilities Act (ACR)

Real Property Asset Management

FAA is implementing DOT's federal real property management initiatives. Since they were established, the Department's efforts have resulted in removal of more than $170 million in real property assets from the FAA portfolio. Savings resulting from the disposition of property have been applied toward future disposition efforts, as well as updates, upgrades, repairs, and renovations of current assets.

FAA's Aviation Logistics Office maintains the Department-wide inventory of real property and the data and performance measures associated with approximately 69,500 buildings, structures, and land parcels in FAA's Real Estate Management System (REMS). FAA conducts a one-third mandated physical annual inventory of approximately 23,000 real property assets each year. A Department-wide Asset Management Plan was approved by OMB, and performance metrics and targets were established and incorporated in the Department's Three-Year Timeline for Real Property. During FY 2008, FAA removed almost 2,500 assets valued at approximately $98 million and thus far in FY 2009, FAA has removed approximately 700 assets valued at $14 million.

E-Government, Information Technology and Communications

Information Systems Security - Under Organizational Excellence, FAA has set a performance target to improve the management of the agency's over $2 billion investment in Information Technology, and protect FAA's critical information systems, networks, and administrative systems from cyber terrorism and malicious activities by hackers and other unauthorized personnel. The Office of the Chief Information Officer has the lead for the *Flight Plan* performance target to ensure zero cyber security events that disable or significantly degrade FAA service. Funding for these activities comes from the Security goal. For more detail on Information Systems Security, please see the Security section of the budget.

Expanded Electronic Government - The main objective under the E-Government goal is to ensure that critical electronic services and information delivered to the users (air traffic controllers, airline pilots, public) are robust and efficiently delivered.

Budget Request Justification

The following section provides a rationale for the budget request supporting FAA's Organizational Excellence goal. The narrative is organized around the activities that support this goal: human capital resources, financial management, real property asset management, information technology and other important organizational support programs.

Human Capital

Workforce Planning and Labor Relations
(Operations, Human Resource Management, $26.7 million, 114 FTE)

Acquiring a Highly Skilled Workforce - Initiatives supporting Human Capital development include workforce and human capital planning and measurement, design and implementation of a Human Capital Accountability System, and the use of information technology to improve the application and selection process. In addition, FAA continues to focus on innovative recruitment strategies including professional marketing and branding campaigns aimed at attracting new talent to FAA. These initiatives are directly aligned to the *Flight Plan* and the Organizational Excellence goal of the DOT Strategic Plan. The funding request related to these activities is required to: 1) identify and fulfill current and future human capital needs to meet FAA's mission; 2) implement corporate systems, policies, programs, and tools to build a results-oriented, high performance workforce; 3) make strategic human resource investments and provide a professional, safe and secure work environment to attract and retain a dedicated and qualified workforce; and 4) improve labor management relations while delivering quality service.

Leadership Development - FAA will implement formal succession planning systems and development programs to ensure continuity of leadership at all levels of the organization. The FAA will continue to modernize and improve its managerial training curriculum to ensure incumbent managers are equipped with the skills necessary to meet NextGen and other major leadership challenges. The agency will put new evaluation, quality improvement, and accountability systems in place to measure and enhance the return on our investment.

Labor Management Relations - In promoting better labor-management relations in FY 2010, FAA will continue to utilize service level agreements to – meet the requirements of lines of business and staff offices, provide labor relations training for agency supervisors and managers, and use the Grievance Electronic Tracking System for data collection, monitoring and reporting. FAA will deploy a more robust automated workload tool to support labor and employee relations.

Discretionary Increase Request: Automated Staffing and Application Process (ASAP)
(Operations, Human Resource Management, $500,000, 0.0 FTE)

This funding is requested to expand the ASAP system's capabilities to more efficiently process the hiring of mission critical positions, including air traffic controllers and safety inspectors. This funding will enable further improvements to the ASAP system which provides critical support for meeting the hiring goals of the Flight Plan's Performance Targets ATC Positions Workforce Plan and Aviation Safety Workforce Plan as well as DOT's human capital initiatives.

Addressing the Air Traffic Controller Retirement Bubble
(Operations, Air Traffic Organization, $966.1 million, 3,689 FTE)

Additionally, FAA is examining and improving the process for hiring air traffic controllers. By studying workforce demographics, hiring, and training practices, FAA is positioning itself to assure its customers of a smooth, transparent, and successful transition to a new air traffic controller workforce. The agency is holding itself accountable for managing this workforce plan by continuing to maintain the air traffic control workforce at or up to 2 percent above the projected annual totals in the Air Traffic Controller Workforce Plan.

Financial Management
(Operations, Financial Services, $24.3 million, 35 FTE)

Cost Control - In addition to SAVES, organizations throughout the agency identify and implement cost efficiency activities to reduce costs. An example of these activities include:

- Containing cost of Worker's Compensation payments (OWCP);
- Consolidation of facilities and services;
- Strategic sourcing for products and services; and
- Eliminating or reducing excess assets.

Improved Financial Performance - FAA is planning to improve the use of information from DELPHI, its financial management system. DELPHI provides FAA with more accurate financial data and allows the agency to better manage its spending on operations, as well as capital investments to ensure the safety of the airways. Planned enhancements to the DELPHI system include improved capitalization workflow and document imaging, possible migration of some legacy systems into new DELPHI functionality, enhanced reporting capability, and continued systems improvements for internal controls.

During FYs 2009-2010, FAA will continue to improve its overall financial management by integrating cost and financial information into the agency's business processes. FAA will accomplish this by:

- Continuing to improve DELPHI through enhancements to budget execution to better track F&E project authorizations.
- Implementing enhancements to the acquisition system.
- Providing enhanced financial training to assure that executives, managers, and staff understand their roles in the stewardship of financial resources.
- Providing executives and managers with the tools necessary to make data driven decisions.
- Implementing FAA's Cost Accounting System (CAS) for the FAA Franchise Services Fund.
- Continue to develop and implement a document management system to support Asset Capitalization.
- Developing new and improving existing financial and travel policy guidance to improve data integrity.

Specific FY 2010 efforts will include:

- Continued efforts to improve and streamline the FAA asset management and capitalization process.
- Implementation of 1) imaging to facilitate invoice tracking and payment, 2) enhancements to the acquisition system and 3) business process enhancements and tools to support capitalization of assets.
- Further enhancements to financial reporting tools to help organizations better understand the cost of operations.

These efforts will be used to improve the way FAA conducts business. The requested budget will enable the continued development and delivery of financial services to support the agency's public mission.

Eliminating Improper Payments – FAA has historically had a very low percentage of improper payments and continues to support DOT in reducing the risks of such payments. FAA will continue to enhance and improve business processes that strengthen the internal controls on the agency's payment process that result in even lower percentages.

Maintain Airport Database Development and Infrastructure Support- Discretionary Increases
(Grants-in-Aid for Airports, Office of Airports, $658,000, 0.5 FTE)

The following are discretionary increases that support the Agency goals of managing assets, improving financial performance and expanding electronic government:

Discretionary Increase Request: Document Scanning Development
($478,000, 0.0 FTE)

ARP is required to retain AIP and Part 139 files until the issue is closed. In order to effectively and efficiently support this requirement, ARP requires contractor support to develop, electronically scan, and maintain all regional and headquarters paper documents into an electronic format accessible via a web interface. The funding will support systems analysis, database development, document scanning, and maintenance support required to maintain files electronically.

All flies in the regional office are retained for 5 or more years for reference, research, FOIA, litigation, and other purposes. When office is at capacity, each office must set aside a day or more to purge files, package, and ship them to the records center. If a document is needed from the records center a request is then made to the records center to ship the boxes to the region. The process is labor intensive, cumbersome, and inefficient. As a result, there is some reluctance to send documents to the records center. Most employees keep files in the file rooms or keep backup hard copies in the office space which creates a duplication of effort. This increases the level of risk associated with loss in the event of a catastrophic event that rendered any regional or district office inaccessible.

Transitioning to an electronic scanning system would support OMB Circular A-130 guidance and the FAA's goals of Cost Control, Improved Customer Service, and Improved Security of automated systems. Additional benefits include:

- Reduce off-site storage costs
- Improve FOIA responses and efficiency
- Reduce physical storage needs in each office
- Reduce strain on the computer and e-mail system by providing multiple locations access to identical documents

Discretionary Increase Request: AIP and PFC Information Technology Staff
($80,000, 0.5 FTE)

An Information Technology Specialist is needed to support the increased information technology requirements necessary to comply with the provisions of the Clinger-Cohen Act, the Federal Funding Accountability and Transparency Act, the Paperwork Reduction Act, and FAA's E-Government and E-Grants activities. New functionality controls and reporting processes are being required from the information systems and organizations supported by these IT programs for Notice of Findings and Recommendations (NFR), E-Gov initiatives and increased requirements due to Economic Recovery initiatives on the ARP automated systems. The successful realization of investment returns, cost controls, schedule and performance goals, risk management plans and efficiencies have become high priority requirements along with the compliance with current mandates and guidelines for IT security, privacy, enterprise architecture, data standardization and assurance.

Currently, the Airports Planning and Programming (APP) office has one Full Time Equivalent (FTE) assigned to these duties, in addition to the role of System of Airport Reporting (SOAR) program manager, Systems Engineer and APP contracting officer technical representative. To support all these functions, processes and reporting requirements APP will require an additional position to perform these duties. The APP IT Specialist requested will fulfill the duties that are inherently governmental.

Discretionary Increase Request: Compliance Activity Tracking System (CATS) Modernization
($100,000, 0.0 FTE)

Modernization is needed to provide contractor support for the following improvements: CATS is currently running on obsolete internet software that causes screens to freeze and information to be dropped. The Air Transport Association and the Airports Council International requested FAA add new data to CATS for assessing airport operational efficiencies, which FAA needs to add to comply with its Congressional mandate. CATS uses a public interface screen that is confusing to users and does not conform to FAA standard "look" for publicly accessible databases.

E-Government, Information Technology and Communications
(Operations, Office of Information Services, $12.5 million, 19 FTE)

E-Government - In FY 2010, FAA's initiatives in support of DOT's electronic government goal will be accomplished through continued improvement of service delivery capabilities and development of project portfolios aimed at key customer groups, as well as projects dedicated to improving internal efficiency and effectiveness. In addition to Information Systems Security, specific E-Government initiatives include Enterprise Architecture, IT Capital Planning, continued agency leadership in Federal lines of business programs, and implementation of consolidated enterprise IT services. FY 2010 activities will involve integrating the Enterprise Architecture into the agency IT investment process in accordance with the 2005 policy, implementing consolidated Help Desk and support services, and implementing FAA information/data resource governance framework.

Improved Financial Management of IT Activities - Under the Chief Information Officer's (CIO) leadership, FAA will improve information processes, optimize IT investments, and support the acquisition and deployment of systems for the NAS. The agency will also continue to carry out its efforts to bring IT costs under control, create agency-wide metrics that track IT costs, integrate the Enterprise Architecture into the agency-wide IT investment process, and consolidate various data repositories. Additionally, the CIO's office will work towards data center consolidation, which will reduce the total lifecycle cost of data center construction for legacy data centers.

Organizational Administration, Improving Employee Attitudes, Customer Satisfaction, and Mission Effectiveness (Aviation Safety, Operations $69.4 million, 420 FTE)

AVS has a variety of activities within Organizational Excellence. For example, AVS supports the Customer Satisfaction performance target by continuing to administer the American Customer Satisfaction Index (ACSI) survey. This survey is the nationally recognized gold standard of measuring customer satisfaction in industry and government.

Most of the AVS Organizational Excellence budget supports AVS internal efforts to become more effective and efficient. For example, skill competencies to be used for recruiting for all positions within AVS have been identified. These new business and interpersonal competencies are required to operate and maintain the Safety Management System (SMS) in AVS. The list of skill competencies establishes a baseline and will be reevaluated in the next three to five years. It includes risk management, evaluation, systems thinking, organizational awareness, workload management, communications, interpersonal skills, teamwork, and negotiating and influencing.

In addition, AVS has revamped its employee overview programs, as well as its initial and recurrent training to stress the need for a risk management approach. AVS management has also placed an added premium on communication and employee outreach to help the workforce accept this significant cultural change.

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FEDERAL AVIATION ADMINISTRATION
RESEARCH, DEVELOPMENT, AND TECHNOLOGY

The FAA's R,E&D program, in partnership with the aviation community, provides world leadership by conducting high-priority research and the development of innovative technologies to support a safe, efficient, and environmentally acceptable global aviation system. The program undertakes research and coordinates its research with both domestic and international partners. It is responsible for establishing and overseeing the FAA's R&D policy and plans, developing its R&D investment portfolio, and serving as the agency's R&D spokesperson. Its diverse scientific, engineering and technical work force supports all aspects of aviation from research on materials to development of new products and procedures.

Under the management of the Office of Research and Technology Development, the R&D program develops and tests specific technologies, tools, and procedures critical to enhancing the FAA's unique mission to regulate and certify airmen and aircraft and to enhance the safety and efficiency of the National Aviation System. The program also enables the FAA to keep pace with new technologies that affect the FAA's ability to regulate and manage the National Airspace System. The FAA publishes the annual National Aviation Research Plan which documents each R&D program area, provides intended outcomes, outputs, programmatic structure, partnerships, and a long-range outlook for the program.

One way, the FAA ensures its research meets the President's criteria for research and development is through the Research, Engineering, and Development Advisory Committee (REDAC), established by Congress in 1989. This group reports to the FAA Administrator on RE&D issues and provides a link between the FAA's program and similar efforts in industry, academia, and government. The REDAC specifically looks at the FAA research programs in terms of the relevance and appropriateness of programs to the National Airspace System and works to ensure that FAA's program goals and priorities properly link to national needs. The Committee also examines the quality and performance of the Research and Development program and provides FAA with advice on how best to allocate funds to ensure a high quality R&D program. The REDAC considers aviation research needs in six key areas: air traffic services, airport technology, aircraft safety, , human factors, and the environment. Representing corporations, universities, associations, consumers, and other agencies, up to 30 REDAC members hold two-year terms. The REDAC meets with FAA senior managers two times a year and annually reviews the Agency's R&D budget submission.

Exhibit V-1

Research, Development and Technology
Department of Transportation
Budget Authority
(in thousands of dollars)

		FY 2008 Enacted	FY 2009 Enacted	FY 2010 President's Request Budget
A. Research, Engineering and Development		**146,828**	**171,000**	**180,000**
A11	**Improve Aviation Safety**	**96,526**	**90,763**	**91,085**
a.	Fire Research and Safety	7,350	6,650	7,799
b.	Propulsion and Fuel System	4,086	3,669	3,105
c.	Advanced Structural/Structural Safety	7,083	2,920	2,448
d.	Atmospheric Hazards/Digital System Safety	3,574	4,838	4,482
e.	Aging Aircraft	15,946	14,589	10,944
f.	Aircraft Catastrophic Failure Prevention Research	2,202	436	1,545
g.	Flightdeck/Maintenance/System Integration Human Factors	9,200	7,465	7,128
h.	Aviation Safety Risk Analysis	9,517	12,488	12,698
I.	Air Traffic Control Airway Facilities Human Factors	10,000	10,469	10,302
j.	Aeromedical Research	7,760	8,395	10,378
k.	Weather Program Safety	16,888	16,968	16,789
l.	Unmanned Aircraft System	2,920	1,876	3,467
A12	**Improve Efficiency**	**30,234**	**43,226**	**48,543**
a.	JPDO	14,321	14,466	14,407
b.	Wake Turbulence	12,813	10,132	10,631
c.	GPS Civil Requirements	3,100	-	-
d.	NextGen: Air Ground Integration - Flightdeck/Maintenance System Integration	-	2,554	5,688
e.	NextGen: Self-Separation	-	8,025	8,247
f	NextGen Weather in the Cockpit	-	8,049	9,570
A13	**Reduce Environmental Impact**	**15,469**	**31,658**	**34,992**
a.	Environment and Energy	15,469	15,608	15,522
b.	NextGen Environmental Research Aircraft Technologies Fuels and Metrics	-	16,050	19,470
A14	**Mission Support**	**4,599**	**5,353**	**5,380**
a.	System Planning and Resource Management	1,184	1,817	1,766
b.	William J. Hughes Technical Center Laboratory Facility	3,415	3,536	3,614
B. Facitilities and Equipment		112,340	145,732	156,926
a.	Advanced Technology Development and Prototype	50,500	35,000	27,100
b.	Plant	17,200	18,400	18,500
c.	CAASD	24,640	22,932	23,226
d.	NextGen Demonstrations and Infrastructure Development	20,000	28,000	33,774
f.	NextGen System Development	-	41,400	66,100
C. Airport Improvement Program, Airport Technology (T)		28,712	34,348	37,221
a.	Airport Technology Research	18,712	19,348	22,472
b.	Airport Cooperative Research	10,000	15,000	15,000
D. Operations		10,043	14,295	11,146
E. Commercial Space Transportation		128	145	145
	Subtotal, Research and Development	**252,139**	**312,772**	**341,491**
	Subtotal, Technology Investment (T)	**28,712**	**34,348**	**37,472**
	Subtotal , Facilities (F)	**17,200**	**18,400**	**18,500**
	TOTAL FAA	**298,051**	**365,520**	**397,463**

EXHIBIT V-2
FEDERAL AVIATION ADMINISTRATION
FY 2010 RD&T Budget Request
($000)

	Performance Goals						
RD&T Program	*Safety*	*Reduced Congestion*	*Global Conn.*	*Environ.*	*Security Prep & Respons*	*Org. Excell.*	**FY 2008 Request**
Federal Aviation Administration							
Fire Research & Safety	7,799						7,799
Propulsion & Fuel Systems	3,105						3,105
Advanced Materials/Structural Safety	2,448						2,448
Digital system Safety/Atmospheric Hazards Research	4,482						4,482
Aging Aircraft	10,944						10,944
Aircraft Catastrophic Failure Prevention Research	1,545						1,545
Flightdeck/Maintenance/System Integration Human Factors	7,128						7,128
Aviation Safety Risk Analysis	12,698						12,698
ATC/Technical Operations	10,302						10,302
Aeromedical Research	10,378						10,378
Weather Research	16,789						16,789
Unmanned Aircraft Systems	3,467						3,467
JPDO		14,407					14,407
Wake Turbulence		10,631					10,631
NextGen – Air Ground Integration		4,175					4,175
NextGen – Self Separation		9,760					9,760
NextGen – Weather Technology in the Cockpit		9,570					9,570
Reduce Environmental Impact of Aviation				15,522			15,522
NextGen – Environmental Research Aircraft Technologies, Fuels and Metrics				19,470			19,470
System Planning & Resource Management						1,766	1,766
Technical Laboratory Facilities						3,614	3,614
Engineering Development Test & Evaluation	27,100						27,100
Plant						18,500	18,500
CAASD		23,226					23,226
NextGen Demonstration & Infrastructure		33,774					33,774
NextGen System Development		66,100					66,100
Air Traffic Organization—Operations	11,146						11,146
Airport Technology Research	11,800	10,672					22,472
Airport Cooperative Research Program	5,000	5,000		5,000			15,000
Commercial Space Transportation	145						145
Total FAA	**146,276**	**187,315**	**0**	**39,992**	**0**	**23,880**	**397,463**

Reference RE&D White Sheets in Section 3C, pages 7 – 153.

Budget Item	Title	Request	Locations	CIP Item(s)
1A01	**Advanced Technology Development and Prototyping**	**$27,100,000**	**Various**	**S09, M08, W10, A28**

FAA Strategic Goals: Increased Safety – To achieve the lowest possible accident rate and constantly improve safety. Objective 1 - Reduce commercial air carrier fatalities; Objective 2 - Reduce the number of fatal accidents in general aviation; and Objective 3 - Reduce the risk of runway incursions.

Greater Capacity - Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Organizational Excellence – Ensure the success of the FAA's mission through stronger leadership, a better trained and safer workforce, enhanced cost-control measures, and improved decision-making based on reliable data. Objective 4 - Make decisions based on reliable data to improve our overall performance and customer satisfaction.

Description of Problem: The FAA's mission is to provide the safest and most efficient aerospace system in the world. As the leading authority in the international aerospace community, FAA is responsive to the dynamic nature of customer needs and economic conditions. A key element of this mission is the safe and efficient use of airspace. To accomplish this mission, FAA's Advanced Technology Development and Prototyping program develops and validates technology and systems that support air traffic services. These initiatives support the goals, strategies, and initiatives of the agency's Flight Plan, including the requirements associated with the evolving air traffic system architecture and improvements in airport safety and capacity.

For FY 2010, $41,800,000 is requested for the following activities:

1. Runway Incursion Reduction Program (RIRP) - ATDP - ($10,000,000):

   Description of Solution: Reducing the risk of runway incursions is a key FAA safety goal and remains on the National Transportation Safety Board's (NTSB) "Most Wanted" list of critical safety issues. During 2007, FAA convened aviation industry stakeholders to a "Call to Action" session to establish near, mid and long-term action plans to mitigate the continuing risk of runway incursions. Several areas of increased technology development emphasis emerged from that session, with the RIRP remaining the principal vehicle for initial development, demonstration, evaluation and establishment of implementation programs for these initiatives. The reduction of high-hazard runway incursions remains the key safety objective as specified in FAA's Flight Plan. The RIRP will remain the catalyst to initiate acquisition activities to facilitate transition of promising safety technologies that have reached a level of maturity deemed appropriate for NAS transition and implementation.

   The requested funds support delivery of performance targets outlined in the FAA Flight Plan and ATO Safety Business Plan. Specifically, the funds will support (1) completion of Low Cost Ground Surveillance (LCGS) pilot program operational trials and the transition from the pilot to a national implementation program; (2) completion of the Runway Intersection Lights operational trials, (3) development of a low cost runway status lights (RWSL) system design for application at non-ASDE-X airports; (4) development of automated taxiway guidance concepts; (5) evaluation of LED technology for application in runway safety systems and (6) evaluation of airport wireless data communications system design alternatives.

Benefits: The demonstration, evaluation and transition of mature runway safety technologies will reduce the incidence of high-hazard (Category A/B) incursion and ultimately reduce the risk of a runway collision. Early development, testing and maturation of viable technologies result in reduced technical, cost and acquisition schedule risk, with early delivery of runway safety benefits.

2. System Capacity, Planning, and Improvements - ATDP ($4,100,000):

Description of Solution: The program will provide data which will be used to develop and analyze airport solution sets contained in the NextGen Implementation Plan; implement the performance-based navigation roadmap by developing Area Navigation (RNAV) and Required Navigation Performance (RNP) routes and procedures; and support the 35 OEP airports' master plans for airfield improvement. Additional studies will analyze the effects of new equipment, technology, and high altitude airspace redesign on delays and congestion. These efforts will be sustained by the use of the Performance Data Analysis and Reporting System (PDARS), Design Team Studies, and Capacity and International Benchmark reports. U.S. aviation policy objectives will be furthered by means of participation in international organizations such as the Civil Air Navigation Services Organization (CANSO) and ICAO. PDARS Staffing Analysis will be used by FAA decision-makers to effectively and efficiently operate with a better prepared, better trained, safer, diverse workforce. These programs collectively drive the achievement of the Office's mission and its support of the Agency.

Benefits: Capacity studies identify the operational benefits and delay-reduction cost savings of capacity enhancement alternatives. Program output includes: flight operational data for use in performance analysis; system safety, delay, flexibility, predictability, and user access performance measures on a daily basis; and travel times within geometric areas and for route segments (arrival fix to runway, runway to departure fix, etc.). Output also includes methodologies and prototypes for measuring the benefits of airport, airspace, and procedural enhancements. PDARS is the Air Traffic Control System Command Center's (ATCSCC) primary tool for accessing radar data and provides an objective tool for operational planning, assessment and support of flow management initiatives. Integration of PDARS with Airport Surface Detection Equipment (ASDE-X); Out, Off, On, and In time (OOOI) data; restrictions data; and playbook scenarios will help to reduce ground delays. These enhancements, which encompass the final phase of PDARS development and are an ATO community requirement, are critical for analyzing surface operations and baselining OEP performance. PDARS is a well-accepted and often-used tool at all major ATC facilities. The impact will be realized on assessments of such issues as wake turbulence mitigation, New Large Aircraft (NLA), Very Light Jets (VLJs), reduced separation criteria, and alternative flow management methods.

3. Operations Concept Validation - ATDP ($8,000,000):

Description of Solution: The project objective is to provide a well-defined and well-understood "validated" operational concept based on system modeling and simulation. This work evaluates and incorporates lessons learned from the recent delivery of decision support tools to provide guidance on "if", "when", and "where" advanced decision support and operational enhancements will be integrated into the NAS. The program develops and exercises advanced analysis capabilities to consider the benefit and operational feasibility of the supported procedural changes. In particular, the program is analyzing the methods for "genericizing" controller areas of specialty recognizing differences between high and low altitude work, opportunities to use multi-sector planners, and the expanded role of Traffic Flow Managers in managing airspace capacity versus limiting demand. It is looking at new ways of providing tower services to enhance tower operations under low visibility conditions. It looks at leveraging automation to change roles and responsibilities of NAS airspace users and service providers. Simulation and human-in-the-loop experimentation are used to integrate this new guidance revealing the type, update rate, and display requirements that need to be established to ensure optimum controller performance. The work program has three thrusts: Operational Concept Development, Concept Validation, and Concept System Design.

Operational Concept Development extends the high level concept of operations and the early validation efforts into detailed concepts of operation for the evolution of Air Traffic Management. Efforts include development of concepts for domains, phase of flight and concepts of use for individual systems as well as classes of enablers such as surveillance. The activity includes interaction with RTCA's Working Groups and the Joint Program Development Office (JPDO) to ensure the concepts are acceptable to the community (as well as providing the FAA's contribution to RTCA funding from this line). The ATS concepts are used extensively in activities such as enterprise architecture, initial and final requirement documents (e.g., ERAM, TFM-M, ADS-B and New Voice Switch) and in investment analysis (the Portfolio activity). The concepts are also used within the ICAO ATM Concept Panel in an effort to keep the global concept, ICAO Standards and Recommended Practices (SARPs) and planning attuned to the US objectives for modernization.

Concept validation efforts provide the performance requirements for information management to support the tactical and strategic common situational awareness assumption and needs of the next generation of ground and airborne support systems, including weather and traffic information distribution. The Operational Concept Validation efforts extend the identification of information type, update rate, and display requirements to decision support tools in general. The project extends the development of performance measures to validate the operational improvements of future concepts. Associated with the changes in roles and responsibilities are opportunities for restructuring the services provided by air traffic control facilities to best support the re-aligned roles of humans in the NAS as enabled by new automation and communication capabilities. Recent activities include analysis of common trajectory service and flight object for en route airspace, distributed air-ground information processing and sharing, and sensitivity analysis of trajectory services for decision support tools which may levy requirements on ERAM.

Concept System Designs looks at operational design implications of future concepts with respect to the type and immediacy of information. Activities include evolution of the en route controller task from active to monitor mode, the role of a strategic controller and its impact. Concept development and conceptual system design provide the basis for validation activities and the derivation of requirements.

The FY 2010 funding request will be used for concept development, concept validation, and requirements development for lower level NAS concepts, such as requirements development and transition planning for the Multi-Sector Planner concept, development of mid-term (2017) requirements for new high altitude concepts and concept validation of far term (2025) high altitude concepts, modeling and requirements analysis of flexible airspace concepts, concept validation of surface concepts, and requirements development for Enhanced Visual Operations, and alternatives analysis and concept validation activities for flexible tower services. These activities will include validation of concepts for ground–ground and air-ground communications to support transfer of information and change the air traffic control paradigm, as well as to validate assumptions about flight deck evolution.

<u>Benefits:</u> The program uses analyses and associated white papers to validate whether future system requirements meet NextGen goals, including the flight data processing evolution in En Route Automation Modernization (ERAM), data communications, the future voice switch, changes in surveillance requirements and associated procedures, establishment of new roles and responsibilities to support increased productivity, etc. This supports the goal of continued US leadership internationally and helps ensure the global harmonization through continued support for the ICAO Global ATM operational concept, the development of global requirements, and the definition of an air transportation performance framework.

4. <u>NAS Weather Requirements ($1,000,000):</u>

<u>Description of Solution:</u> One of FAA's top priorities is predicting and responding to weather.

Weather has a significant impact on safety and efficiency and affects activities across all domains. The NAS Weather Group minimizes the negative impacts of weather on the NAS operations by increasing operational predictability during weather events (particularly during winter weather and convective weather situations). The NAS Weather Group develops aviation weather policy and standards; represents FAA in Joint Planning and Development Office (JPDO) Weather Integrated Planning Team; and manages the research, engineering, and development (R,E&D) and ATO Capital Activity 1 weather portfolio. The NAS Weather Group manages the NAS Requirements Development program to align requirements, priorities, programs, and resources and develops metrics to understand the impacts of weather on the NAS. The program creates strategic plans and defines weather requirements, and policy and standards. FAA is the Meteorology Authority for the U.S. under the International Civil Aviation organization (ICAO). On behalf of FAA, the NAS Weather Group provides national and international leadership to optimize aviation weather systems and services by establishing consensus and cooperation within FAA and between Government agencies, private weather services, research organizations and user groups on aviation weather requirements and priorities.

The requested funds will continue the contract support that provides a flexible means to direct attention and resources to concerns affecting safety, system efficiency and international leadership, changing focus as needs develop. This funding will be used to address problems in each of these three areas:

- Requirements. Analysis and technical planning support work to develop mission analysis, functional analysis, functional requirements, and performance requirements for NAS users.

- International. Promote US current and NextGen solution sets at the ICAO to realize global harmonization and accelerate change. FAA is the Meteorology Authority for the U.S. under ICAO. As such the Weather Office provides national and international leadership to both reduce the differences between the US and ICAO and to more closely align ICAO standards with NextGen standards. Provides the technical support and analysis necessary to reduce differences and align standards with the NextGen concept.

- Strategic Direction. Develop aviation weather requirements that align with NextGen requirements, including establishing research and development requirements for weather capabilities that will meet future NextGen requirements. Negotiate with other agencies for cost-sharing for NextGen investments. Work with the developers of decision support tools to integrate weather information into those tools. Provides the analytical and technical support not available within FAA to develop the strategic direction for the use of aviation weather capabilities.

Benefits: A large amount of work accomplished by the program is geared toward the movement of aviation weather products, including safety risk management functions from R&D into operational use. Accomplishment of the work in this budget line will allow:

- Increased RE&D/F&E Activity-1 productivity from better R&D priority management
- Improved weather information (observations/forecasts) for increased NAS operational safety, efficiency and capacity
- Consolidation of processors, resulting in reduced operating costs
- Open architecture enabling lowered development costs
- Reduced communications costs with simultaneous improvement in product access resulting from NEO
- Reduced equipage and training costs for air carriers resulting from closer conformance with global standards

5. Airspace Redesign ($3,000,000):

Description of Solution: The goal of regional and national airspace redesign efforts is to address congestion and delays in our nation's busiest airports. We accommodate growth by enhancing the efficiency and reliability of the NAS. Airspace redesign efforts seek to optimize Terminal, En Route and Oceanic airspace by redesigning airspace in NY/NJ/PHL, CAP, Western Corridor, HAATS, and with HAAM. F&E funding is planned for NY/NJ/PHL, CAP, Western Corridor, HAAM and national integration efforts of the program office. Airspace redesign efforts will modernize airspace in support the new flows associated with new runways in Chicago (ORD) and in Las Vegas.

In FY 2010, Airspace Redesign requests $3,000,000 in F&E funds to provide the following:

1) Infrastructure changes resulting from the airspace redesign supporting the Chicago and New York/Philadelphia metropolitan
2) Infrastructure changes resulting from the airspace redesign supporting the Western Corridor project
3) Infrastructure changes resulting from the airspace redesign supporting the High Altitude Airspace Management project
4) Engineering analyses of operational feasibility of airspace concepts supporting transition to NextGen

Benefits: The airspace redesign projects supported by these FY 2010 F&E funds are projected to deliver as much as $121 million of direct operating cost benefits by 2015. These benefits are realized through the reduction of restrictions, shorter flight distances, more fuel efficient routes, and reduced delays. The most significant benefits will be in the key metropolitan areas. Airspace redesign in New York and Philadelphia metropolitan areas will reduce delays by 20 percent in the next 10 years; based on today's flight statistics. In Chicago, airspace redesign will ensure return on the runway investments. With airspace changes and the new runway, delays can be reduced by as much as 60 percent. Airspace redesign will also provide internal FAA benefits. Without airspace redesign, sector splitting and growth in the number of sectors will be the only methods to manage complexity and congestion, increasing operations costs by millions every year. Reducing the number of sectors in the HAAM program through standardization and reallocation of airspace boundaries could provide a minimum of $20 million of annual FAA cost savings.

6. Wake Turbulence ($1,000,000):

Description of Solution: In FY 2010, $1,000,000.00 is requested to provide prototype development, evaluation and requirements definition for the Wake Turbulence Mitigation for Arrivals (WTMA) air traffic control decision support tool. This work will lead to an FAA acquisition in FY 2013 to transform the capabilities of the prototype into functioning tools for use by the FAA air traffic controllers. First operation benefit will be realized during FY 2015 when the system is first used in an airport's operation. This solution will allow the reduction of the required diagonal wake turbulence separation distance to 1.5 NM or less when instrument operations are being conducted and there are favorable crosswinds. This translates to 2 to 4 more arrival slots per hour for an airport that uses its closely spaced parallel runways for arrival operations and has a significant percentage of 757 and heavier aircraft traffic.

Benefits: Implementation of the Wake Mitigation for Arrivals (WTMA) air traffic control decision support tool at potentially 12 to 17 candidate airports having a significant number of 757 and heavier aircraft operations and use their closely spaced parallel runways for arrival operations, would yield $20M per year in Aircraft Operator Cost savings. Savings come from maintaining a higher airport arrival rate than that is presently set when an airport is required by weather conditions, to shift from capacity efficient visual landing operations to instrument landing system (ILS) operations. Under today's current closely spaced parallel runway ILS operations, the aircraft spacings revert to those used for aircraft landing on a single runway, essentially cutting the landing capacity of the airport's closely spaced parallel runways in half. When crosswinds are present on the airport's approach corridor, WTMA would provide 2 to 4 additional arrival slots per hour for airports that are serving a significant number of 757 and heavier aircraft. WTMA will also provide Passenger Value of Time savings - estimated to be to be $25M per year if implemented at 15 airports. Better definition of benefits will be a product of the WTMA evaluations that will be funded by this project. This initial benefit estimate was done jointly by the FAA Wake Turbulence Program Office and the associated NASA research organization as part of a process to develop potential solutions for reducing the required wake separations on ILS approaches to closely spaced parallel runways.

Budget Item	Title	Request	Locations	CIP Item(s)
1A02	**NAS Improvement of System Support Laboratory**	**$1,000,000**	**1**	**F-14**

FAA Strategic Goal: Organizational Excellence – Ensure the success of the FAA's mission through stronger leadership, a better trained and safer workforce, enhanced cost-control measures, and improved decision-making based on reliable data. Objective 3 - Improve financial management while delivering quality customer service.

Description of Problem: The FAA's centralized set of laboratories located at the William J. Hughes Technical Center provide the infrastructure for research, development, testing, and field support to the FAA's Capital Investment Plan (CIP) programs. It is necessary to modify, upgrade, and reorganize the Laboratory infrastructure as CIP projects and their supporting systems are delivered, installed, and eventually removed. The Technical Center Lab infrastructure encompasses approximately 160,000 square feet in the main building plus numerous outlying buildings and remote sites.

Description of Solution: The Technical Center's System Support Laboratory provides the environment to implement, test, and integrate new systems into the National Airspace System (NAS). Once accepted, the systems become part of the test bed and are used to provide support to the operational field sites over the life-cycle of the operational systems. To maintain a viable test bed, it is periodically necessary to upgrade and enhance those portions of the facilities that support the systems and form an integral part of the test bed. Electronic switching systems are used to permit replication of the myriad-fielded system configurations and to permit multiple parallel testing configurations to run with a minimum of system components. The switching systems must be upgraded, enhanced, and expanded to meet the changing needs of the CIP system deliverables.

In FY 2008, $1,000,000 was appropriated for system support laboratory improvements, such as the Business Continuity Plan design and beginning of modifications, the mockup tower renovation, router and firewall, rack servers and tape silos, and power quality monitoring and usage system expansion. In FY 2009, $1,000,000 was requested for various improvements to the Laboratory systems in order to support CIP programs.

For FY 2010, $1,000,000 is requested for various improvements to the Laboratory systems in order to support CIP programs.

Benefits: The program improves FAA's centralized state-of-the-art laboratory environment that supports the implementation, testing, and integration of new NAS systems prior to their delivery to the various FAA field sites. The single, centralized support laboratory helps FAA the avoiding cost of establishing and maintaining multiple laboratories for each project, program, Service Unit, and Line of Business.

Budget Item	Title	Request	Locations	CIP Item(s)
1A03	**William J. Hughes Technical Center Facilities**	**$12,000,000**	**1**	**F-14**

FAA Strategic Goals: Organizational Excellence – Ensure the success of the FAA's mission through stronger leadership, a better trained and safer workforce, enhanced cost-control measures, and improved decision-making based on reliable data. Objective 3 - Improve financial management while delivering quality customer service.

Description of Problem: The FAA's centralized set of laboratories located at the William J. Hughes Technical Center provide the infrastructure for research, development, testing, and field support to FAA's Capital Investment Plan (CIP) programs. These laboratories provide around the clock operations support to En Route, Terminal, and other Air Traffic Control (ATC) facilities throughout the nation. It is necessary to sustain these Laboratory systems in configurations and capabilities that match field sites that currently exist or are planned for the future. CIP programs and field sites depend on these laboratories to fulfill their mission.

Description of Solution: For FY 2010, $12,000,000 is requested to sustain FAA's laboratory test beds and will be used for hardware and software support, software licensing fees, and other costs associated with operating these multi-user facilities. These laboratories include the en route and terminal test beds; navigational, scan radar, and automated tracking sites; communications switching equipment; the aircraft fleet (flying laboratories); aircraft simulation systems such as the target generator, cockpit simulators, and the Human Factors Laboratory.

Benefits: The support is necessary for the successful development and implementation of various programs of the CIP. In addition, ATC field facilities support mission will continue throughout the transition from today's system to the full implementation of FAA's modernization efforts. These facilities provide in-house testing required to ensure new systems and modifications are thoroughly evaluated in an integrated environment to minimize problems prior to field deployment. A stable funding source obviates the need for each program office to establish and sustain the infrastructure needed to support their programs and fielded systems. This has been a proven method to sustain the Test Beds and to minimize FAA costs..

Budget Item	Title	Request	Locations	CIP Item(s)
1A04	**William J. Hughes Technical Center Infrastructure Sustainment**	**$5,500,000**	**1**	**F16**

FAA Strategic Goals: Organizational Excellence – Ensure the success of the FAA's mission through stronger leadership, a better trained and safer workforce, enhanced cost-control measures, and improved decision-making based on reliable data. Objective 3 - Improve financial management while delivering quality customer service.

Description of Problem: The William J. Hughes Technical Center (WJHTC) owns and operates test and evaluation facilities, research and development facilities, administrative and storage facilities, and numerous project test sites. The Technical Center must keep the Central Utilities Plant (CUP), utility distribution systems, and the building infrastructure in operating order. The WJHTC must also comply with International Building Codes, the National Fire Codes (NFC), the Americans with Disabilities Act (ADA) and current energy policies.

The Center's Water Plant was constructed in the 1940's and is well beyond its estimated service life. A private engineering firm's 20 year master plan for 34 buildings identified significant deficiencies. An electrical investigation during a 2007 construction project revealed that certain high voltage electrical cables are in marginal condition. The Building 300 roof is at the end of its useful life and has been a maintenance nightmare. The Center has a need to evaluate the feasibility of improving both its electrical security and also its bargaining position in the current energy market.

Description of Solution: $5,500,000 is requested for FY 2010 for the following activity tasks:

Water Plant Replacement: This project replaces a water plant that has significant structural problems and is over 60 years old, well beyond the estimated service life. The plant replacement will drastically improve water generation reliability, a critical feature since this plant provides potable water to all Center facilities. Finally, the replacement effort will reduce maintenance costs, as the repair of a small portion of the plant distribution piping in 2006 cost approximately $100,000.

Center Facility System Improvements: A 20 master plan, prepared in FY 2008, recommended replacement of architectural, structural mechanical, electrical, plumbing and life safety systems and subsystems in 34 Center facilities. This project replaces systems and equipment beyond their useful lives, and upgrades all deficient systems and equipment before serious operation and maintenance problems occur. The improvements will increase energy efficiency at these facilities by as much as 20 percent.

Primary Electric Cable Replacement: This project replaces damaged, underground, high voltage electrical feeders serving Buildings 301, 303 and 305 that are approaching the end of their useful lives. This project improves the reliability of cooling to the Building 300 ATC Lab Area, which houses the NAS Test Bed, BCP and eventually NEXTGEN. This is a good business case as it will pay for itself through the elimination of just one power loss due to cable failure.

Building 300 Roof Replacement: This project will replace a roof that is beyond its useful life of 15 years with a roofing system that will be more appropriate for the facility. The project will significantly reduce roofing maintenance costs since as many as 10 leaks have occurred after a single, heavy rainstorm and identifying the source of a leak can require the removal of approximately 10,000 square feet of roofing area.

Evaluation of a Combined Heating and Power Facility: This evaluation will systematically and quantitatively determine the economic feasibility of installing a combined heating and power facility on Center. Such a facility has the potential of improving both utility security and reliability. The facility would also reduce energy costs (dollars) by improving the Center's bargaining position when procuring electricity from third party suppliers.

Benefits: The modifications will ensure the continued reliable operation of the WJHTC by replacing aged mechanical, electrical, and life safety equipment and required utility and other support systems before serious problems occur. The work will also improve life cycle infrastructure planning; update certain facilities, facility support systems and utility distribution systems; reduce energy consumption on a per square foot basis; and enable the Center to support changing FAA programs and missions. The program incorporates best business practices and adopts industry standards such as ASHRAE, NEC, NEMA, ANSI and IEEE.

Budget Item	Title	Request	Locations	CIP Item(s)
1A07	**NextGen Demonstrations and Infrastructure Development**	**$33,773,730**	**Various**	**G8M**

FAA Strategic Goal: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: The Federal Aviation Administration (FAA) Next Generation Air Transportation System (NextGen) demonstration and infrastructure development program was established to assist in transforming the National Airspace System (NAS) to meet the vision of the future NAS as defined by the Joint Planning and Development Office (JPDO). Led by the Advanced Technology Development and Prototyping (ATD&P) Group, this program is designated to integrate demonstration projects and programs, provide validation of mature solutions, and demonstrate implementation alternatives for the NAS, as well as sustain the ATD&P NextGen demonstration sites. This program provides agility and flexibility in demonstrating alternative technologies, and concepts, while supporting procedure and standards development, as well as providing for the integration of near-term emerging technologies, procedures and / or customers' initiatives with on-going demonstrations. The demonstration program leverages the individual project demonstrations and supports the integration of these individual projects into multiple-domains designed to capture the synergies that are needed to provide timely NAS transformation. The ATD&P NextGen demonstration and infrastructure development program also directly supports emerging technology solutions and airspace customer solutions that will allow the FAA to define how future air traffic and airport operations will be managed, how the environment will be protected and enhanced, and how improvement to efficiency, safety and capacity can be achieved near-term. The ATD&P demonstration and development program directly supports how the NAS will evolve and operate in the 2015 timeframe and beyond, and how the long-term objectives of validating 4-Dimension Trajectory Based Operations (4-D TBO) for all NAS domains will be accomplished, along with follow-on performance-based air traffic management (PATM).

The United Nations IPCC allocates only 2–3% of today's global carbon dioxide (CO2) emissions to aviation. While its overall contribution is relatively small, aviation is considered one of the few rapidly-growing contributors. Efforts to minimize the industry's environmental impacts will be complicated by anticipated increases in both domestic and international air transportation operations.

Environmental impacts resulting from aircraft noise and emissions could emerge as a significant constraint on aviation industry growth. Cooperation to address the industry's environmental challenges could both maximize aviation's collective environmental improvements, and mitigate the potential adverse effects that environmental impacts and society's concerns may impose on industry growth.

Reduced energy consumption and engine emissions are core aviation business principles. Since 1970, the number of airline passengers transported in the United States has tripled while community exposure to significant aircraft noise has decreased almost 95%. Aircraft today are 60% more fuel efficient than the fleet operating 40 years ago. Progressively stringent aircraft noise and emission standards have been established over the past three decades. These include a phase out of Stage 1 and Stage 2 airliners. Airports have voluntarily implemented noise abatement and emission control programs, supported by airport improvement funding and passenger facilitation charges. As of 2007, the U.S. airline industry is moving 12% more passengers and 22% more freight than it did in 2000, with 5% less fuel burned and commensurate emissions reductions.

With increasing demand the need grows to achieve peak throughput performance at the busiest airports and in the busiest arrival/departure airspace. Capability improvement via new procedures to improve airport surface movements, reduce route spacing and separation requirements, and improve overall tactical flow management into and out of busy metropolitan airspace is needed to maximize traffic flow and airport usage. Essentially the problem is getting the right aircraft to the right runway in the right order and time to minimize its individual impact on the system and maximize the use of these airports. Thus operations are conducted to achieve maximum throughput while facilitating efficient arrival and departure. Inefficiencies in any aspect of the operation reduces the total use of the capacity and, because of high demand, causes excessive compounding of delay.

Operation of Unmanned Aircraft Systems (UAS) in the NAS is strictly controlled. Operators of UAS must apply to FAA for authorization to engage in flight activities and operations must be specifically authorized. Applications are reviewed by elements of the Air Traffic Operations organization and the Aviation Safety Unmanned Aircraft Program Office to ensure that approval to fly unmanned aircraft, regardless of size, will not compromise the high level of safety for other aviation and the public and property on the ground. Operators must apply for a Certification of Authorization or Waiver (COA) to operate an unmanned aircraft. UAS flights are not permitted over populated areas and no hazardous material may be carried or objects dropped outside of Restricted Area Airspace. Other restrictions may be applied that hamper the accomplishment of the UAS operator's mission. The COA process has been implemented until concerns over the safety of UAS operations can be allayed. The demonstration project is part of the process to prove the viability of UAS to operate safely in the NAS without undue risk. The ultimate goal is that UAS have unfettered access to the NAS. Unfettered access to the NAS for DoD UAS is a growing imperative. Future civilian demand is anticipated.

The following shortfalls in the existing NAS need to be considered and resolved:

1) The integration of individual-domain (intra-domain) which would allow for end-to-end (or multi-domain) demonstration and testing

2) The immediate (near-term) integration of new emerging technologies, or applications into existing or planned demonstrations

3) NAS near-term demonstration initiatives supporting government / industry partnership demonstrations

4) The sustainment of the individual or end-to-end (multi-domain) demonstration sites.

Costs for new towers for medium-sized airports have approached $30 million per airport. With several hundred towers needing repair or expansion, the total annual operating costs are, or will exceed, budget expectations by a substantial margin. Runway safety enhancements need to keep pace with traffic growth and demand.

<u>Description of Solution:</u> NextGen demonstrations will be conducted in close cooperation with both internal FAA and JPDO. Demonstration, developmental, and validation activities, transforming technology resources (demonstration sites and end-to-end demonstration activities) will include the following for FY2010:

- Environmental: International Air Traffic Interoperability:
  - Continued demonstrations of trajectory-based management in the arrival domain to collect benefits data for a reduction in the carbon footprint of aviation operations.
  - Flight demonstrations across the Atlantic to provide requirements and standards for future automation upgrades.
  - Surface management improvement demonstrations to reduce taxi times for less fuel consumption.
- High Density Capacity: High Density Airport (HDA) Capacity and Efficiency Improvement:
  - A second site demonstration of the 3D Path Arrival Management tool will be conducted to collect additional data to enhance efficiency, provide greater capacity, and reduce fuel consumption.
- Unmanned Aircraft Systems (UAS) 4D:
  - Flight trials will be conducted in Florida to facilitate the need for integration of DoD and other governmental agency UAS operations into the NAS. Demonstrations

provide a means to validate and prove concepts and establish confidence in the safety case for UAS. Demonstrations support ongoing work of RTCA Special Committee 203 (SC-203) which is developing performance requirements for operation of UAS in the NAS. This work will lay the foundation for the Minimum Aviation System Performance Standards (MASPS) for UAS and other regulatory criteria leading to the safe operations of UAS in the Next Generation Air Transportation System (NextGen).

- Staffed NextGen Towers:
  - Air Traffic System Concept Development will conduct cognitive walkthroughs, rapid prototyping, and human-in-the-loop simulations to refine the Staffed NextGen Tower (SNT) concept and requirements. We will conduct a field demonstration for Phase 1 of the SNT concept in FY10.
    - As part of Phase I, both lab and field demonstrations will be conducted to further examine SNT alternatives and assess their feasibility. Information collected from the cognitive walkthroughs and rapid prototyping activities will facilitate the development of human-in-the-loop simulations and preliminary requirements. The simulations will allow for identification and further refinement of the preliminary requirements and comparison of the SNT alternatives in a controlled laboratory environment. The simulations will also provide for early resolution of potential operational issues and provide information that will be used in the design of the field demonstration.
  - A field demonstration will be conducted at a site to be determined (TBD) using an SNT system in FY10. The field demonstration will serve as a proof of concept and as a comprehensive site for testing of the technology in an operational environment. Operational, technical, and human factors data will be collected and user feedback obtained on their assessment of the operational feasibility, suitability, and acceptability of the concept.
- Demonstration Site Development / Sustainment:
  - The demonstration sites being considered include Orlando, FL, Dallas, TX, and the FAA's WJHTC. Demonstrations will continue to be conducted for faster and more reliable testing and results using multiple systems -- the beginning of integration for NextGen. We will emphasize the integration of individual-domain (intra-domain) which would allow for end-to-end (or multi-domain) demonstration and testing. These sites will provide immediate (near-term) integration of new emerging technologies, or applications into existing or planned demonstrations, while NAS customers see these sites as a visible, near-term step toward initiatives that support government / industry partnerships.
- Joint Planning Development Office (JPDO)
  - The JPDO will enhance and maintain the multi-agency Joint Planning Environment that provides a transparent web-based view of Enterprise Architecture and Integrated Work Plan information.

<u>Benefits:</u> The NextGen Technology Demonstration program is a development effort to support the transformation of the NAS to 4-D trajectory management and a performance-based system. The program provided integration and demonstration of alternate technologies and concepts, while supporting procedures and standards development, integration of near-term emerging technologies and airspace customers' initiatives with on-going scheduled demonstrations. This program provides a vehicle to test concepts and leverage individual transformational program and project technology to create multi-domain cohesive demonstrations to capture the synergies needed to transform the NAS in an expedited manner. The evaluation of technology and the collaboration between public / private industry partners, ANSPs, customers, and owners will continue into perpetuity.

Budget Item	Title	Request	Locations	CIP Item(s)
1A08	**Next Generation Air Transportation System (NextGen) - System Development**	**$66,100,000**	**Various**	**G1M, G6M, G7M, M25**

FAA Strategic Goals: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 1 - Increase capacity to meet projected demand and reduce congestion.

Description of Problem: In 2003 under Public Law 108-176, Congress created a multi-agency Joint Planning and Development Office (JPDO) to manage work related to the Next Generation Air Transportation System (NextGen) to meet air traffic demand by 2025. The JPDO's 2004 Integrated Plan identified three key performance targets to achieve the desired capability by 2025. These are (1) satisfy future growth in demand up to three times current levels; (2) reduce domestic curb-to-curb transit time by 30 percent; and (3) minimize the impact of weather and other disruptions to achieve 95 percent on time performance. Achieving these targets by 2025 is a challenge. In addition, an increase in demand to three times current levels could cause a similar increase in the number of accidents, aircraft noise and emissions, and air traffic controller workload. This line item provides the research and development required to resolve these potential problems.

The solution involves four areas of research and development – safety, capacity, human factors, and environment. The safety research includes expanding information sharing and data analysis to identify and mitigate risks before they lead to accidents. The capacity research develops new air traffic management systems to support NextGen; measures NextGen concepts to determine if they achieve the targets for 2025; and develops flexible airspace categories to increase throughput. The human factors research provides higher efficiency levels in air traffic control and identifies the new role for controllers as more responsibility shifts to the flight crew. The environmental research explores new procedures, and adapts new technologies and fuels into the National Airspace System (NAS) to reduce emissions, fuel burn, and noise; and includes demonstrations, methods to adapt the current infrastructure, and estimates of costs and benefits.

1. ATC/Technical Operations Human Factors (Controller Efficiency and Air Ground Integration) ($10,000,000):

   Description of Solution: Automation and technology must work in concert with the humans in the system to meet the targeted efficiency levels. This program targets the integration and harmonization of the various NextGen concepts into a workable solution that intelligently adds the many new capabilities, decision support tools and automation to the diverse NextGen actors' workstations to achieve the desired performance outcome. Human factors aspects of existing air traffic control systems are a limiting factor for traffic loads. Projected traffic loads will exceed the capability of our current mode of air traffic control when traffic levels exceed approximately 130 percent of 2004 levels (baseline). Achieving the capacity targets of NextGen and achieving self-separation between aircraft by the flight crew requires significant changes in the roles and responsibilities between pilots and controllers and between humans and automation. Integration of air and ground capabilities poses challenges for the air traffic service provider and the flight crew. A core human factors issue is to ensure that safety is maintained. Information on intent as well as positive information on delegation of authority must be clear and unambiguous; and analyses of new types of human error modes are required to manage safety risk in the changing environment.

   In FY 2010, the program will refine the HSI Roadmap, continue development of the common air traffic workstation, and define requirements for integrated en route and terminal situation displays and procedures. The program will develop collaborative ATM information and communication flows; refine air traffic selection processes using the results of the updated Strategic Job Task Analysis and begin development of NextGen training needs using the results of the Strategic Training Needs Analysis. The program will have an additional focus on collaboration between the various actors in the NAS (controllers, pilots, dispatchers, traffic flow managers, maintainers, etc.). This portion of the program will result in preliminary human error and safety analysis concerning changes in air traffic service provider and flight crew roles and responsibilities to manage safety of the NAS; define preliminary roles and responsibilities for actors in the NAS to achieve required performance; develop a simulation and demonstration roadmap laying out incremental objectives, simulation requirements, assumptions, and risks for assessing integration of ATSP tools, including for weather and wake separation; and assess improved weather displays that provide accurate and timely graphical weather information in the en route and terminal domain.

Benefits: The human component is arguably the most important and least addressed part of NextGen. In the system engineering context the NextGen system is incomplete and is at risk of inadequate performance. This program will measure the human performance benefits of NextGen as each of the components converge at the workstation – which is the point of delivery of air traffic services. This program will also address the air ground integration issues that stem from the interactions between the actors in the NextGen system. Unless benefits are measured with the human in the loop the benefits are not based on the total system.

Quantitative benefits data will be developed during the course of human-in-the-loop simulations. Each simulation will establish baseline performance and compare to performance under the new configuration. Human performance is measured in terms of number of macro elements such as aircraft being managed, airport or sector throughput, controller workload, and situation awareness. Other performance measures relate to task performance and micro measures such as number of keystrokes or time to visually scan a display to extract an element of information. Qualitative benefits data will be developed to address the acceptability of technology and procedures. Efficiency measures will likely be qualitative.

This program will assure that the workstations, decision support tools and automation used by air traffic personnel support the delivery of operational improvements. Without this program the scores of decision support tools and automation will converge on the controller and will suffer from lack of use, misuse, and abuse. The relationship between the actors in the NextGen NAS must be understood so that roles and responsibilities are in alignment with authority and policy and can be fully exercised.

2. Environment and Energy – Environmental Management System and Advanced Noise and Emissions Reduction ($7,000,000):

Description of Solution: The environmental research provides new and advanced aircraft and engine technologies, alternative jet fuels and operational procedures to reduce fuel burn, and emissions and noise impacts towards achieving NextGen environmental goals. A critical component of this research includes explorations, simple demonstrations as well as methods to integrate these environmental impact mitigation and energy efficiency options with the NextGen infrastructure in a costs-beneficial manner. It will also provide ways to adapt the NAS infrastructure to fully exploit the benefits of these environmental mitigation and energy efficiency options. This research program will also support development and implementation of Environmental Management System (EMS) which will manage NextGen related environmental impacts both at the organizational and enterprise levels.

- Environment and Energy – Environmental Management System. Robust aviation growth will cause commensurate increases in fuel burn, and noise, and emissions impacts unless effective and cost-beneficial mitigation measures are implemented. The NextGen environmental goal is to achieve environmental protection that allows sustained aviation growth. Knowledge of human health and welfare impacts of aviation noise and emissions and their related health and welfare impacts metrics to enable appropriate means are critical to mitigate these environmental effects. These numerous highly complex environment and energy issues are interrelated, dynamic, and evolving. This complexity and change requires a framework that adapts to feedback and system changes to continually optimize mitigation approaches by well developed and demonstrated environmental impacts metrics. The strategic EMS will move the air transportation system toward the achievement of long-term goals through the establishment of management system elements at an enterprise and organizational level. It will support improved data and data-flow to enable better decision-making, which in turn, will enable technology, operational procedures, and policy to be refined, applied and adapted to cost effectively meet the needs of real operating conditions.

- Environment and Energy – Advanced Noise and Emission Reduction. Robust aviation growth will cause commensurate increases in fuel burn, and noise, and emissions impacts unless effective and cost-beneficial mitigation measures are implemented. The potential for environmental damage could restrict capacity growth and prevent full realization of NextGen. Effective and proven capabilities as well as NAS-wide implementation of advance technologies, alternative jet fuels and improved operational procedures are the key to reduce significant environmental impacts while improving the energy efficiency of the system. This program element provides the interface between NextGen Environment and Energy Research and Development program designed to develop fuel burn, noise and emissions reduction options and the EMS which will manage the NextGen environmental impacts. This program also provides the interface between demonstration of new operational procedures in the NAS and exploration and early demonstration of procedures specifically targeted at environmental benefits.

Benefits: Manage environmental impacts of NextGen through Environmental Management System based on development and demonstration of solutions to mitigate noise and emissions and increase fuel burn efficiency Each research element in this line item has a target for the year 2016 that involves a demonstration. The demonstrations will prove concepts and show that it is possible to meet the target operationally by the year 2025.

- Environment and Energy – Environmental Management System. By 2016, this program element will provide system knowledge and processes to implement and manage NextGen system alternatives in the cost-beneficial manner to achieve environmental protection that allows sustained aviation growth. This program element will combine progress on environmental improvements relative to advance technologies, alternative jet fuels and improved operational procedures developed under related programs into a comprehensive Environmental Management System approach. Progress will be measured by demonstrating no environmental constraints at 166 percent capacity by 2011; at 230 percent capacity by 2013; and finally at 300 percent capacity by 2016. Research and development supports operational implementation by 2025.

- Environment and Energy – Advanced Noise and Emission Reduction. By 2016, this program element will demonstrate that aviation noise and emissions can be significantly reduced in absolute terms in a cost-beneficial way and proven ways of managing uncertainties in noise, health and climate impacts to levels that enable more informed action. Progress will be measured by demonstrating (under the following program element) no environmental constraints at 166 percent capacity by 2011; no environmental constraints at 230 percent capacity by 2013; and finally no environmental constraints at 300 percent capacity by 2016. Research and development supports operational implementation by 2025.

3. New Air Traffic Management (ATM) Requirements ($13,200,000):

Description of Solution: In FY2010, the FAA must continue developing the capabilities needed to make required capabilities supportive of NextGen solution sets. These capabilities are highly dependent on technologies that accurately predict and monitor the location and intent of aircraft and provide this information to other pilots, controllers, and other stakeholders. Some of the aspects of the NextGen Concept of Operations depend upon the aircraft as a participant in efficient, safe air traffic management both in-flight and on the airport surface. These capabilities also rely on procedures that keep traffic flowing smoothly in all weather and visibility conditions both in-flight and on the airport surface. The NextGen New ATM research initiative will result in enhanced methods of determining safe separation while optimizing capacity, for all flight regimes and all aircraft. The New ATM Requirements program will identify and develop the operational requirements for the following programs:

Traffic Collision Avoidance System (TCAS)

- Analysis, requirements, pseudo-code- supports provide effective collision risk safety net in an environment of closely spaced parallel RNP route from top-of-descent to the runway

L-Band Communications Standard

- Complete evaluation in relevant environments through trials and test bed development;
- Propose the appropriate L-Band solution for input to a global aeronautical standardization activity

C-Band Standard

- Goal IEEE 802.16e C-Band standard best suited for airport surface wireless mobile communications
- Conduct evaluation of an aviation specific standard to support wireless "mobile" communications in relevant airport surface environments
- Develop a channelization methodology for allocation of safety and regularity of flight services in the band to accommodate a range of airport classes, configurations and operational requirements.

Software Standard for Air/Ground Integration

- Continue analysis of approaches/methodologies for software assurance of complex air-ground systems.
- Develop a coordinated airborne and ground software assurance standard to support Air-Ground operational integrity.

Common Trajectory Requirements and Implementation Strategy

- Identify Trajectory Differences
- Evaluate Need and Fidelity
- Propose Standard for Exchange
- Analyze System changes and Allocations

Mid-term Advances in Tactical Flow

- Integration of EDA advances into ATM (allocation to ERAM & TMA)

Integration of Weather into DSTs (mid-term)

- Weather Information Requirements

  - Individual trajectory analysis

  - Correlation of forecast impact

- Wake into DST's

RNAV/RNP via Data Communications

- Delivery across data communications-requirements
- "On the fly" development, evaluation and delivery

Airborne SWIM

- Identify information distribution requirements for non-command and control information
- Evaluate alternatives
- Propose standard (if required)

Benefits: This program element conducts research to develop systems that support the capacity enhancements for seven solution sets of NextGen. By 2015, the research will demonstrate that the planned system can handle growth in demand up to three times current levels; demonstrate that gate-to-gate transit time can be reduced by 30 percent; and demonstrate that the system will allow achievement of a 95 percent on-time arrival rate. Progress on the research will be measured under the following program element. Research supports operational implementation by 2025.

Benefits include:

(1) International standards and validated technologies for air-ground data communications in L-band for continental flight domains, air-ground and ground-ground data communications in C-band for airport surface operations, and air-ground data communications in SatCom bands for oceanic, polar and remote operations.

(2) Networking layers standards for international interoperability of data communications across the physical and datalink standards proposed for use in L-band, C-band and SatCom bands.

4. Operations Concept Validation (Validation Modeling) ($10,0000,000):

Description of Solution: The Operations Concept Validation Program addresses the FAA's goal for capacity and the DOT Reduced Congestion Strategic Objective to "Advance accessible, efficient, inter-modal transportation for the movement of people and goods." It also supports the FAA's National Aviation Research Plan goal for a "Fast, Flexible and Efficient" system that safely and quickly moves anyone and anything, anywhere, anytime on schedules that meet customer needs. The program supports these goals by developing and validating future end-to-end (flight planning through arrival) operational concepts with special emphasis on researching changes in roles and responsibilities between the FAA and airspace users (e.g., pilots and airlines), as well as the role of the human versus systems, that will increase capacity and improve efficiency and throughput. It fits within the Air Traffic Organization's pathway 4, "Ensure Viable Future" to assure a sustainable and affordable Air Transportation System for the future by developing future operational concepts that will decrease workload and increase reliance on automation for routine tasking, and new procedures both on the ground and in the air to increase efficiency of the NAS. Furthermore, this program works toward developing operational methods that will meet the NextGen goal of expanding capacity by satisfying future growth in demand (up to three times capacity) as well as reducing transit time (reduce gate-to-gate transit times by 30 percent and increasing on-time arrival rate to 95 percent.).

As proposed system alternatives for NextGen develop, there must be an understanding of the economic and operational impact of the proposed solutions. This requires a thorough understanding of how the aerospace system operates, the impact of change on system performance and risk, and how the system impacts the nation. There must be methods, metrics, and models that demonstrate whether or not the proposed solution contributes to increased capacity, reduced transit time, or increased on time arrivals; and if so, how much the solution contributes. The demonstration must address the combined solution as a system in terms of its progress toward and ultimate achievement of the NextGen targets. This program will conduct research to identify and validate changes to current air traffic management operations that will foster increased system capacity, efficiency, and throughput. Concept validation activities will ensure the future concepts are feasible, will realize expected benefits and identify the human factors implications of the concepts. Validated operational concepts will identify technical and operational requirements, such as airspace, procedures, and Communications, Navigation, Surveillance, and Automation requirements, needed to realize the capacity gains.

The FY 2010 research will focus on End-to-End concept development and validation activities for operational changes for NextGen solution sets. Specific concept elements will be validated through simulation and modeling.

Benefits: By 2016, this program element will provide system knowledge to understand economic (including implementation) and operational impact (with respect to capacity improvements) of NextGen system alternatives. It will measure the proposed NextGen system alternatives to determine whether or not the system meets the capacity targets of NextGen. It will develop methods, metrics, and models to measure capacity improvements. Progress will be measured by demonstrating capacity increases to 166 percent current levels by 2011; 230 percent by 2013; and 300 percent by 2016.

5. Systems Safety Management Transformation ($16,300,000):

Description of Problem: In 2003 under Public Law 108-176, Congress created a multi-agency Joint Planning and Development Office (JPDO) to manage work related to the Next Generation Air Transportation System (NextGen) to meet air traffic demand. This increase in capacity must be accomplished while continuing to (1) maintain aviation's record as the safest mode of transportation, (2) improve the level of safety of the U.S. air transportation system, and (3) increase the safety of worldwide air transportation Achieving these targets by 2025 is a challenge. This line item provides the research and development required to improve safety as air traffic grows. This will be accomplished through an integrated safety management approach that will provide a proactive means for building safety into the air transportation system we are developing and safely managing it through the transition. Key to this transformation will be the development of cutting-edge operational data analysis capabilities for the identification of safety issues. This research will promote expansion of the U.S. capability to meet national and international safety goals and objectives with less oversight of individual carriers.

Description of Solution: Achieving NextGen will require a full-scale transformation of the NAS, because our current system simply is not scalable to handle the required changes. A fully successful NextGen system is dependent on careful examination and integration of what technologies and responsibilities should reside with the aircraft and what technologies and responsibilities should reside on the ground. At the same time, safety will remain the top priority of FAA. Transforming the system will require a thorough understanding of the operational impact (with respect to safety) of system alternatives. While pursuing three times current levels of capacity, FAA will continue to pursue reduced fatality rates.

In FY2010, activities to support requirements for: data analysis capabilities to predict, identify, and mitigate safety risks before they become accidents; safety guidelines to help stakeholders develop their own safety management systems; and modeling to help measure progress toward achieving FAA goals.

Benefits: Research and development identifies constraints and barriers, and separates solutions that are effective from those that are not. In FY2014, the capabilities to perform a National Level System Safety Assessment that will proactively identify emerging risk across the NextGen will be demonstrated. The demonstration will prove the capabilities are on track to meet operational targets by the year 2025. The benefits are: (1) capacity increased to three times current levels; (2) curb-to-curb transit time reduced by 30 percent; (3) on time performance increased to 95 percent; (4) noise and emissions reduced in a cost effective way to allow three times capacity; (5) air traffic controller efficiency increased to three times current levels; (6) aerospace-related fatality rate reduced commensurate with capacity increase; and (7) understanding of economic and operational impact of system alternatives. Benefits for the items in this FY 2010 request are as follows:

This program contributes to reducing the fatality rate commensurate with increases in capacity under NextGen. By 2015, this program element will provide system knowledge to understand economic (including implementation) and operational impact (with respect to safety) of NextGen system alternatives. The research outcomes include an infrastructure that enables the free sharing of de-identified, aggregate safety information that is derived from various government and industry sources in a protected, aggregated manner; and demonstration of a National Level System Safety Assessment working prototype that will proactively identify emerging risk across the NextGen. Research supports operational implementation by 2025.

6. Wake Turbulence (Re-categorization) ($2,000,000):

Description of Solution: In FY 2010, $2,000,000.00 is requested to continue the development of a new safe, but more capacity efficient set of wake separation standards. The last full review of wake separation standards used by air traffic control occurred nearly 20 years ago in the early 1990's. Since then, air carrier operations and fleet mix have changed dramatically, airport runway complexes have changed and new aircraft designs (A-380, very light jets, unmanned aircraft systems) have been introduced into the National Airspace System (NAS). The 20 year old wake separation standards still provide safe separation of aircraft from each other's wakes but no longer provide the most capacity efficient spacing and sequencing of aircraft in approach and en-route operations. This loss of efficient spacing is causing an unnecessary gap between demand and the capacity the NAS can provide.

Recently work was done with the air traffic control wake separation standards to accommodate the A380 class of aircraft and work continues to address introduction of other large aircraft. This project will build on that joint work and accomplish a more general review to include regional jets, unmanned aircraft systems, microjets, etc. The work is phased, starting with optimizing the present "1990's" air traffic control wake separation standards to reflect the change in fleet mix that has occurred over the last 20 years. By 2010, the project will have a set of recommendations for international review that focuses on changes to the present static standards. To accomplish this, the project will develop enhanced analysis tools to link observed wake behavior to standards, determine safety risk associated with potential new standards relative to existing standards; simulate and validate new separation standards; integrate the work being accomplished by EUROCONTROL; and conduct analyses to link wake transport and demise characteristics to aircraft flight and surrounding weather parameters.

The next phase of this project will develop by 2014, sets of air traffic control wake separation standards whose application would depend on flight conditions and aircraft performance; resulting in being able to get more aircraft into and out of airports and in the same volume of airspace. By 2020, the final phase of the project will have developed the aircraft and ground based capabilities required to achieve the NextGen concept of safe, efficient dynamic pair-wise separation of aircraft. The dynamic pair-wise separation capability will allow the densest feasible safe packing of aircraft in a given airspace.

Benefits: This project will contribute to the NextGen target of handling growth in air traffic demand of up to three times current levels. The project will focus on re-categorization of wake separation standards in three steps. By 2010, it will provide static safe capacity efficient changes to the present air traffic control wake separation standards, using the six current aircraft weight categories adjusted to account for fleet mix changes. These changes are projected to allow some airports to increase their arrival and departure rates by several aircraft per hour. By 2014, the project will develop an alternate set of wake separations standards and procedures for use under specific conditions to safely place more aircraft in the same volume of airspace. By 2020, the project's outcomes will support dynamic, pair-wise wake separation of aircraft - which will provide the most capacity efficient aircraft spacing that is theoretically possible. If the development of a means to dynamically pair-wise separate aircraft proves successful, operational implementation of the dynamic capability is projected to be in the 2025 time frame.

7. NextGen Operational Assessments ($7,500,000):

Description of Solution: The transition to NextGen requires the conduct of operational assessments to ensure that safety, environmental, and system performance considerations are addressed throughout the integration and implementation of NextGen. Such assessments are particularly important as the NextGen program begins to evaluate current airspace design and as new procedures are developed and implemented within the NAS. In FY 2010, funding is requested to conduct system wide operation performance, system wide safety assessments, environmental-specific assessment, and system risk management activities.

Benefits: This project will contribute to system safety enhancements across the NAS, aircraft emissions and noise reduction, capacity, efficiency, and delay reduction.

Budget Item	Title	Request	Locations	CIP Item(s)
4A09	**Center for Advanced Aviation System Development (CAASD)**	**$23,226,000**	**Various**	**M03**

FAA Strategic Goal: Greater Capacity – Work with local governments and airspace users to provide increased capacity in the United States airspace system that reduces congestion and meets projected demand in an environmentally sound manner. Objective 2 - Increase reliability and on-time performance of scheduled carriers.

Description of Problem: The FAA, along with its aviation partners, faces a broad range of technically complex challenges to achieve the Next Generation Air Transportation System (NextGen). Although FAA employees are highly knowledgeable about those technologies, it would be impossible to employ all of the research, science and engineering expertise needed to develop and improve them. The FAA requires highly specialized simulation and computer modeling capabilities that it does not have in-house and are only available through a Federally Funded Research and Development Center (FFRDC) that has unique knowledge, skills, and capabilities in aviation research, systems engineering and analysis. The establishment of a stable source of funding, along with a long-term contractual relationship, is in the best interest of the public and the FAA, because it permits economies that can only be supported with an established work force and provides continuity of services for an efficient and effective use of an experienced professional staff.

Description of Solution: The Center for Advanced Aviation System Development (CAASD) is a Federally Funded Research and Development Center (FFRDC), operating under a Memorandum of Agreement with the MITRE Corporation. CAASD has unique knowledge, skills, and capabilities in aviation research, systems engineering, and analysis. CAASD also conducts a continuing program of research, development, system architecture, and high-level system engineering to meet FAA's long-term NAS requirements. A long-term contractual relationship is in the best interest of the public and FAA, because it stabilizes funding and supports an established and experienced work force that provides continuity of services. In addition, CAASD's charter permits access to sensitive and confidential agency information and data that is not normally available to support contractors. CAASD's expertise is critical to FAA in transforming the nation's air transportation system in an effective and timely manner.

The FY 2010 funding will support approximately 275 MITRE Technical Staff years (MTS) of research and systems engineering as well as technical and operational analyses. This staffing level is well below the Congressional ceiling of 600 MTS. The FFRDC Executive Board has approved the third edition of the FFRDC Long Range Plan (FYs 2008– 2012).

For FY 2010, $79,000,000 is requested to continue research and development, advanced analysis, and engineering in the following areas.

NAS and NextGen Systems Integration and Evolution. Develop and integrate the NextGen enterprise architecture, operational concepts, capability action plans, and roadmaps to achieve an integrated evolution and align agencies' enterprise architectures; analyze NAS-wide strategic issues involving multiple outcomes for efficient investment and operational decisions; provide definition, structure, and content for the NAS EA and ensure alignment with the evolving NextGen architecture; provide recommendations for U.S. and international flight data processing to improve NAS operations and global harmonization; assess and provide recommendations for NAS evolution paths to maximize the use of common capabilities and automation platforms that will support investment decision making; validate the productivity gains, operational feasibility and user benefits of selected NAS initiatives to effect the transition to NextGen; assess service and cost benefits and provide recommendations for implementing net-centric strategies that reduce NAS complexity and improve user access to information.

Communications Modernization. Conduct technical analyses on architecture alternatives at the program, service, and domain levels to ascertain which alternatives meet the required level of NAS communications service at least cost; conduct engineering analysis, network definition, and transition strategy studies for the FAA's Voice Communications and SWIM programs to provide robust network-enabled operations and to reduce the overall FAA communications costs; conduct cost analyses on spectrum and radio technology issues applied to the problem of extending the existing air-ground voice communications systems. As options for life extension develop, CAASD will work with the FAA's NextGen plan and other CAAs around the world to develop the next generation system. This will enable the FAA to take a global leadership role in aviation communications; provide technical and operational insight into the implementation of digital and data communications services in the NAS. Ensure that FAA and the user community understand the operational benefits to be gained.

Performance Based NAS. Provide new concepts for achieving a performance-based NAS, for example, the RNP Parallel Approach Transition (RPAT) concept, which utilized CAASD's operational knowledge, laboratories, and visual tools in its development; conduct technical analyses to identify airports and runways that will benefit from RNP and RNAV procedures; develop algorithms and prototype performance case analyses to validate Flight Standards procedure development tools; identify problems that emerge in the implementation of RNP and RNAV procedures and recommend resolutions and new criteria requirements using CAASD's air traffic, airline, and avionics expertise; analyze and model all aspects of navigation assets, including Wide Area Augmentation System (WAAS), Local Area Augmentation System, (LAAS), divestiture of navigation aides, modernization of GPS, and interoperability with other Global Navigation Satellite System (GNSS) systems (e.g., Galileo).

En Route Evolution. Perform system engineering analyses for new technologies, capabilities, and procedures for the en route system architecture and operational applications; develop concept of operations and prototypes to demonstrate and evaluate new capabilities and procedures; conduct risk management analyses to identify and mitigate the key risks for capability completion; conduct benefit and cost analyses for new capabilities; assess and prioritize candidate en route extensible capabilities; develop system-level requirements for capabilities that can be transferred to the development contractor; validate innovative approaches that can reduce the time and cost of training controllers; develop and conduct field evaluations of a simulation training prototype that will provide effective transition of automation and procedural advancements into operation use; validate the operational feasibility and expected productivity gains from changing roles and responsibilities in the en route domain.

Terminal Operations and Evolution. Provide FAA with technical analyses that inform decision making on which technical architecture alternatives provide the required level of service and minimize costs; provide technical and operational insight into systems that can be used to safely permit reduced separation standards and/or significantly increase overall system capacity and productivity, including factors such as system technical performance, weather measurement performance, human factors engineering, operational evaluation, safety assessment, and decision support system design; provide operational feasibility and implementation risk analyses that assist the FAA in identifying and prioritizing among the more promising operational changes, procedures and enabling technologies; provide technical and operational expertise to enhance the quality and efficiency TRACON controller training, to allow for reduced training time and cost, improve trainee success rates, and improved workforce capabilities (e.g., reduced operational errors, improved productivity).

Airspace Design and Analysis. Structure and execute technical analyses that will inform FAA and Industry decisions on airspace design and management; engineer the processes that govern airspace strategic planning and analysis efforts; investigate, innovate, and develop modeling, simulation, and analysis capabilities facilitating airspace design; explore issues that influence strategic airspace management and design policy, such as sectorization concepts; integrate all the above efforts to provide a national, system-wide optimization of airspace, leveraging CAASD experience, and perspective to coordinate multi-regional and multi-facility design efforts and other national airspace activities.

NAS System Operations. Improve the NAS system-level performance by assessing system performance during severe weather and snowbird seasons; design, develop, and evaluate solutions to significant issues with FAA operational personnel and customers responsible for implementing the solutions; develop improved analytic techniques and capabilities for system operations analysis; develop operational strategies to manage emerging and chronic congestion problems by modeling capacity, delay, predictability, ripple effects, and access issues; design and evaluate solutions with FAA operational personnel and customers responsible for implementing the solutions; develop improved measurement techniques for assessing operations; improve the FAA's responsiveness to customer issues and improve traffic management strategies by modeling and assessing major operational problems with integrated analysis to verify alternate solutions; develop new modeling and analysis capabilities for analytic weaknesses; design, model, and assess new system operations procedures for new capabilities and airspace changes that will be implemented in the near future; develop analysis techniques and data to improve information on en route and terminal operations used in FAA operational and investment decision making; develop and evaluate new metrics to measure overall NAS operational performance.

Traffic Flow Management (TFM) Operational Evolution. Provide analysis of the TFM requirements and system design in order to ensure that developed system enhancements will meet the current and future operational needs in a cost-effective manner; develop metrics that provide insight into the performance of the TFM domain; provide assessment of concept maturity, operational feasibility and implementation risks; advance the maturity of concepts to account for uncertainty (e.g. probabilistically) in predictions and decision making, by developing algorithms and prototype capabilities and conducting (HITL) evaluation that will improve the FAA's ability to predict imbalances between traffic demand and real NAS capacity; translate concepts into requirements and assess the impact of enhancement capabilities on the TFM modernization system so that implementation cost and difficulty can be factored into the prioritization planning process for new capabilities and procedures.

Future NAS Performance and Analysis. Assess the NAS-wide operational impacts of investment options and decisions; improve understanding of the future environment, including anticipated demand at airports and for airspace; anticipate the impact of planned improvements on future airport and airspace capacity; perform analyses to assess the affordability and long-term economic implications of different investments, operational changes, or proposed policies.

Aviation Safety. Perform technical analyses of NAS-wide accident and runway incursion risk to identify airports or specific types of operations with the highest risk, and prioritize implementation of appropriate operational and technological mitigations, leading to a reduction in accidents and runway incursions; develop metrics and processes that allow FAA to proactively identify potential safety issues with both operations and architecture; identify risks before they lead to incidents or accidents; identify and assess the feasibility of new or advanced capabilities and standards that mitigate safety issues in the NAS.

Mission Oriented Investigation and Experimentation (MOIE). Develop the tools and techniques for studying system capacity, throughput, performance, system dynamics and adaptation to technology- and policy-driven change; identify opportunities for innovative solutions to NAS problems and enhancements to NAS capabilities and procedures, and capitalize on them through applied research and technology transfer; research future concepts and technologies to understand their potential impact on the NAS and to develop and refine concepts for operational use and potential benefits; use prototyping and in-lab demonstration and experimentation to learn what works and what doesn't, and incorporate stakeholder feedback and building industry consensus on the way forward in key areas; strengthen FFRDC systems engineering skills and tools by exploring new regimens including complexity theory, agent-based modeling, and productivity modeling; leverage collaborations with industry, academia, and the broader aviation research community.

NAS-Wide Information System Security. Provide technical guidance on the most effective way to engineer security capabilities into the NAS, emphasizing a NAS-wide approach that reduces overall cost by leveraging shared services and building security into the underlying IT infrastructure; provide guidance on security threats, technology, standards, and practices being applied in other government and commercial enterprises in order to evolve Information Systems Security (ISS) to adapt to changing threats and technology advances; develop requirements and recommend solutions for effective cyber incident management program; advise the FAA on creating an IT infrastructure that will be resilient, flexible, and adaptable, and provide a defense-in-depth strategy; apply MITRE experience with the DOD's successful transition to Network Centric Operations and CAASD's NAS domain knowledge to provide technical guidance on deploying network centric technologies within the NAS while maintaining ISS defense-in-depth.

Broadcast and Surveillance Services. Research ADS-B ground and cockpit-based solutions that will permit the FAA to deploy ADS-B throughout the entire NAS in a cost effective and timely manner, while reducing the cost of ownership for FAA surveillance infrastructure and ATC, and improving safety for all NAS users; prototype basic and advanced ADS-B applications that will result in improved efficiency and capacity for FAA and the airlines. This includes transforming applications that will leverage the aircraft as an active part of the NAS, as in the NextGen vision, and result in more efficient NAS operations; assess the impact of ADS-B on safety, capacity, and efficiency benefits for the FAA and users. This includes performing user coordination and lab simulations prior to deployment, and data collection and analysis after deployment; develop domestic and international requirements and engineering standards for future ADS-B applications, in close coordination with the users and manufacturers, as part of RTCA, the ICAO, FAA, RFG, and Eurocontrol standards development activities.

Special Studies, Laboratory and Data Enhancements. Manage the breadth of the CAASD FAA work program in a manner that ensures the activities contributing to each individual outcome benefit from the broader perspective of the entire work program; provide the CAASD work program with a research environment where prototypes and capabilities can be brought together with the appropriate mixture of fidelity and development flexibility to facilitate integration investigations, compressed spiraling of operational concepts and procedure development; exploration of new technologies, visualization of concepts, exploration of human factor issues, and transition of prototypes between the lab and the field; provide the CAASD work program with a an efficient aviation data repository system and associated tools to support data analysis that results in more useful products across the work program at a lower cost; provide the CAASD work program with a flexible model of the NAS capable of quickly and reliably estimating the high-level impacts of new technologies, procedures, or infrastructure improvements on key system performance metrics; conduct special studies of key subjects, as directed by FAA senior management.

Benefits: High quality research, systems engineering, and analytical capabilities help FAA meet the technically complex challenges in the NAS. CAASD provides independent advanced research and development required by the FAA to obtain technical analyses, prototypes and operational concepts needed to fulfill the vision for NAS architecture, FAA's Flight Plan, the Operational Evolution Partnership (OEP) – FAA's plan to NextGen - and the NextGen Integrated Plan. CAASD efforts support all Flight Plan goals across the board and the FFRDC continues to play a key role in defining NextGen. Its expertise is critical to FAA's efforts to transform the nation's air transportation system in an effective and timely manner.

Detailed Justification for Airport Technology Research (ATR)

Budget Item	Program Title	Budget Request
ARP	**Airport Technology Research**	**$22,472,000**

Overview:

For FY 2010, research will be conducted in the areas of airport pavement, airport marking and lighting, airport rescue and firefighting, airport planning and design, wildlife hazard mitigation, and visual guidance. This research results in updates to ACs, manuals, and technical specifications that airports rely on when expending AIP funds.

FY 2009 Base:

FAA managers and engineering staff both at Headquarters and at the William J. Hughes Technical Center review projects proposed for research. The FAA's Research and Advisory Airport Subcommittee meets with FAA engineers and managers every six months to review research progress as well as the proposed future research requirements and priorities that are reflected in this submittal. The Subcommittee includes representatives from airports, aviation associations, aviation industry, aircraft manufacturers, and the Airline Pilots Association. This mix of airport users ensures that the research proposed is what the airport community needs and reflects their priorities.

The research conducted is producing significant benefits in increased safety and potential cost savings. For example, a GAO report in February 2002 estimated the costs to widen taxiways from 75 feet to 100 feet to meet the standard for new large aircraft such as the A-380 would be $509 million. As a result of research efforts that measured B-747 taxiway deviations at the John F. Kennedy and Anchorage airports, FAA was able to conduct a rigorous risk assessment that justified modification to standards that will permit operations of A-380 aircraft on existing 75-foot-wide taxiways with some conditions. This research project alone could avoid expenditure of hundreds of millions in AIP funds to unnecessarily widen taxiways. Other ongoing pavement research has produced a new pavement design procedure - FAA Rigid and Flexible Integrated Elastic Layered Design (FAARFIELD) - for thickness design, rehabilitation and overlay design using improved material specifications that promise to reduce pavement thickness while maintaining pavement life. New design procedures also promises to save hundreds of millions of dollars in pavement construction and rehabilitation.

In support of safety, research is being conducted in airport lighting and marking to improve pilot situational awareness and reduce runway incursions. Research in innovative methods to reduce the hazard of wildlife strikes to aircraft is also ongoing. Research results are published in a widely distributed manual that provides practical techniques for controlling wildlife near airports. The FAA is evaluating bird detection radar in a cooperative program with the Department of Defense and industry to provide real-time bird hazard data to airport users. Ongoing research is also conducted in aircraft rescue and firefighting and in the use of runway deicers and associated environmental issues.

Research also led to the development of engineered materials arresting systems (EMAS) that have been installed at more than 25 airports and have successfully safely stopped overrunning aircraft in four separate instances.

Anticipated FY 2009 Accomplishments:

- Complete study of Next Generation High Reach Extendible Turret.
- Complete validation of commercial avian radars.
- Complete evaluation of alternative runway groove shape on asphalt and concrete runway surfaces.
- Complete evaluation of camera based FOD detection systems at Boston Logan and Chicago O'Hare.
- Complete evaluation of a mobile FOD detection system at Chicago's Midway Airport.
- Complete evaluation of Taxiway Deviation data collection at Manchester, NH and West Palm Beach and Orlando, FL, and Chicago O'Hare.

- Complete phase 1 study of fire fighting agent quantities for NLA.
- Initiate full scale testing of composite fires at NLA Facility, Tyndall AFB, Panama City, FL.
- Complete Report on New Photoluminescent Technology for Visible Surface Markings
- Evaluate effectiveness of a prototype alternative runway groove shape.
- Complete Study of Engineered Material Arresting System cold region freeze-thaw durability
- Complete Testing of Effects of Runway De/Anti-Icing Chemicals on Traction
- Initiate Experimentation on Alternative Arresting System Concepts
- Continue analyzing full-scale data from the NAPTF.
- Improve upon airport pavement thickness design package, including 3D finite element structural models, using FAARFIELD, an analytical program developed for the Agency.
- Complete a final report on rubblization of airfield pavements.
- Start development of a web-based application for airport pavement database management system.
- Develop models for airport funding strategies and passenger surveys.
- Continue full scale testing and analyze effects of subgrade quality and aircraft wheel gear spacing.
- Perform full scale testing and analyze effects of high tire pressure of aircraft wheels.

FY 2010 Budget Request:

The table below summarizes the research activities funded by this request. ($000)

Research Project	FY 2009*	FY 2010 Request	Increase/ Decrease
Contracts			
Advanced Airport Pavement Design	450	468	18
Pavement Design & Evaluation Methodology	900	936	36
National Airport Dynamic Tests	2,500	2,500	0
Field Instrumentation & Testing	540	750	210
Improved Paving Materials	1,100	1,350	250
Non-Destructive Pavement Testing	980	1,100	120
Pavement Roughness	420	437	17
Material Testing Laboratory	300	200	(100)
CEAT-University of Illinois	300	312	12
Airport Planning	350	364	14
Airport Design	700	728	28
Operation of NLA	800	800	0
Composite Materials Firefighting	616	453	(163)
Airport Wildlife Hazards Abatement	2,500	2,500	0
Airport Visual Guidance/Incursions Reduction	1,825	4,200	1,375
Soft Ground Systems Follow on	300	312	12
Surface Technology	1,000	1,000	0
Rescue and Fire Fighting	420	581	204
Subtotal--Contracts	**16,001**	**18,991**	**2,033**
In-House (FTEs)	**3,347**	**3,481**	**134**
TOTAL	**19,348**	**22,472**	**2,167**

The main increase for FY 2010 is $1,375,000 for visual aids to increase this item to a total of $3,200,000. The increase is required to start work on development of a visual aids test For visual guidance we will start a multiyear initiative to develop a state of the art visual guidance technology test bed that would enable visual guidance engineers an opportunity to design, install, test, monitor, and report on what it will take to create a visual guidance infrastructure that will take full advantage of state of the art technologies in Signs, Lighting and Markings to provide a more efficient infrastructure and the best visual cues to the airport user.

Major advances in visual guidance technology have brought forth new brighter, more efficient and more conspicuous lighting devices, enhanced paint material that lasts longer than traditional paint, and airport signage that is easier to read from greater distances. This new technology, when compared with the current state of visual guidance systems, warrants that the FAA undertake a major research effort to enhance these essential systems, making improvements that will best serve the future of our nations aviation. The FAA's conceptual "NextGen" Program talks about levels of air traffic increasing to three times what it is today, bringing thousands and thousands of aircraft to smaller airports that have historically seen very little traffic. The demand for the visual guidance infrastructure at these airports will increase significantly, bringing with it higher levels of usage, higher performance requirements, and higher costs to maintain. Today's General Aviation community is already indicating that there is a need to enhance their visual aids, citing examples of aging power cables, antiquated fixtures, and high energy costs as major problems that they are experiencing now.

*** FY09 Base and Anticipated Accomplishments are contingent upon an enacted authorization with Contract Authority at or above $3,514,500,000.**

Detailed Justification for Airport Cooperative Research Program (ACRP)

Budget Item	Program Title	Budget Request
ARP	**Airport Cooperative Research Program**	**$15,000,000**

Overview:

For FY 2010, FAA proposes to continue funding this program from the Grants-in-Aid for Airports appropriation and maintain the funding level at $15,000,000. ACRP was authorized by section 712 of Vision 100 – Century of Aviation Reauthorization Act.

FY 2009 Base*:

The Secretary of Transportation signed the Memorandum of Agreement among DOT, FAA, and National Academy of Sciences to implement the ACRP. The Secretary also appointed the 13 members of the board of governors of the ACRP. The Transportation Research Board (TRB) of the National Academy is administering the program. The ACRP board of governors has met every 6 months to review progress and select additional topics to fund. Over 100 submitted topics will be reviewed at the July 2008 meeting and the most promising topics selected for contract award in FY 2009. The Board of Governors selects the highest rated topics, subject to the funds available, to proceed to contract solicitation and award. The TRB appoints expert technical panels for each selected project. The technical panels convert the topics into requests for proposals to select contractors to perform the research. The panels also monitor each project to ensure it stays on track and meets project deliverables.

The ACRP program is off to a good start. Over 90 research projects are underway. The first two studies were delivered in FY 2007.

Anticipated FY 2009 Accomplishments*:

- ACRP Technical Panels monitor progress and deliverables on research projects awarded in FY 2008 and FY 2009.
- Board of governors meet twice during FY 2009 to select projects to fund with the funds appropriated in FY 2009.
- TRB appoint project technical panels to monitor FY 2009 research projects awarded.

*** FY09 Base and Anticipated Accomplishments are contingent upon an enacted authorization with Contract Authority at or above $3,514,500,000.**

EXHIBIT V-3
SUPPORT FOR SECRETARIAL AND ADMINISTRATION RD&T PRIORITIES
($000)

Priority	Supporting RD&T Programs	FY 2009 Request ($000)
Safety — *Secretarial Priority*	Fire Research and Safety (A11.a)	$7,799
	Propulsion and Fuel System (A11.b)	3,105
	Advanced Structural/Structural Safety (A11.c)	2,448
	Atmospheric Hazards/Digital System Safety (A11.d)	4,482
	Aging Aircraft (A11.e)	10,944
	Aircraft Catastrophic Failure Prevention Research (A11.f)	1,545
	Flightdeck/Maintenance/System Integration Human Factors (A11.g)	7,128
	Aviation Safety Risk Analysis (A11.h)	12,698
	Air Traffic Control Airway Facilities Human Factors (A11.i)	10,302
	Aeromedical Research (A11.j)	10,378
	Weather Program Safety (A11.k)	16,789
	Unmanned Aircraft System (A11.l)	3,467
	Engineering Development Testing & Evaluation (1A01)	27,100
	Airport Technology Research	22,472
	Airport Cooperative Research	15,000
	Air Traffic Organization—Operations	11,146
	Commercial Space Transportation	145
System Performance and Reliability – *Secretarial Priority*	JPDO (A12.a)	$14,407
	Wake Turbulence (A12.b)	10,631
21st Century Solutions for 21st Century Transportation Problems – *Secretarial Priority*	Air Ground Integration (A12.d)	$5,688
	Self-Separation (A12.e)	8,247
	Weather Technology in the Cockpit (A12.f)	9,570
	Environmental Research Aircraft Technologies, Fuels and Metrics (A13.b)	19,470
	Demonstrations & Infrastructure Development (1A07)	33,774
	System Development (1A08)	66,100

EXHIBIT V-4
IMPLEMENTATION OF R&D INVESTMENT CRITERIA

R&D Investment Criteria	How Applied	Actions Reflected in FY 2010 Request
Relevance	FAA uses established strategic and budget planning processes, which facilitates portfolio development, strategic decision making, and prioritization The R&D program is planned in consultation with internal and external stakeholders, including an external advisory committee, the FAA's Research, Engineering and Development Advisory Committee, and its internal Research and Development Executive Board Goals, priorities, R&D strategies, and benefits are published in the National Aviation Research Plan – these support both the FAA and DOT strategic plans. Relevance is assessed both prospectively and retrospectively through the Research Engineering and Development Advisory Committee and other external review mechanisms Within the FAA, researchers work closely with agency customers to ensure the continuing relevance of research products	The FAA's REDAC and its standing subcommittees reviewed FAA's proposed FY 2008 R&D program and approved it.
Quality	The Part on FAA's R&D Program found that it was well managed and results-oriented, with a strategic plan that sets forth clear long-term goals that are tied to program performance measures. FAA uses an external and internal peer – review process to ensure quality. Managers prepare and vet program plans through a process that ensures good science and proper use of public funds. Program quality is assessed retrospectively through the Research, Engineering and Development Advisory Committee and other internal and external regular and ad hoc reviews.	Individual programs are executed under the competitively based FAA Acquisition Management System. Management processes conform to FAA best practices all projects go through internal and external peer review. Programs/processes follow recognized best practices (e.g., ISO 9000, Malcolm Baldridge). The REDAC reviews program quality annually. FAA's R,D&T programs are monitored to identify programs variances in scheduling and funding needs. Over time, program goals are modified to reflect new technologies and innovations. The FY 2010 budget request reflects program needs based on current assessments. It includes identified changes resulting from the internal and external reviews.
Performance	The program has long-term performance measures tied to specific research projects that support accomplishment of nations and agency goals. The program has annual performance measures that can demonstrate progress toward long-term goals.	As with the Quality criteria, the FAA applies the Relevance criteria in determining its annual budget requests and how it manages its R&D programs. The R&D program

	Performance is documented in an Annual Performance Plan in Quarterly and Annual Performance Plan Goal Reports. FAA publishes annual results in R&D Annual Review. The program works with external organizations (REDAC, National Academy of Science, etc.) to obtain feedback/peer review.	has developed long-term performance measures and performance is documented in a variety of publicly available reports and plans. The program also seeks external peer review to ensure performance goals are met.